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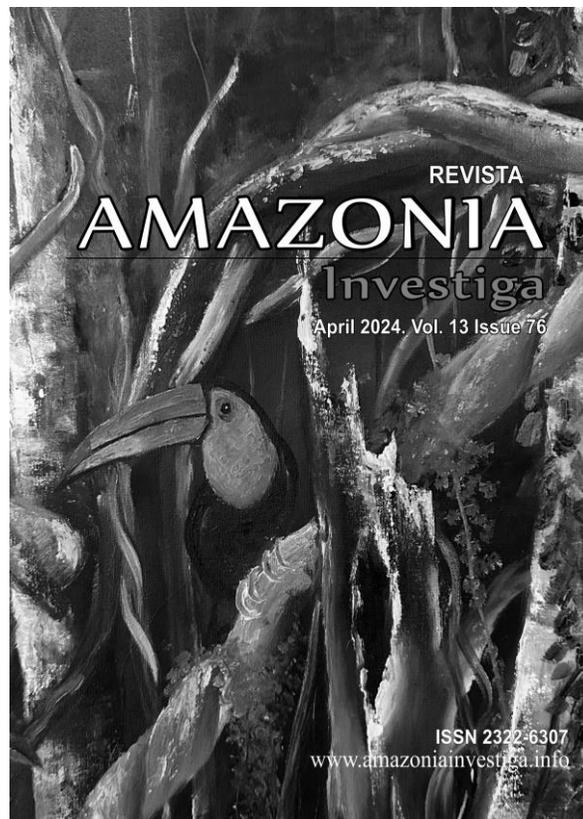


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## Network science to correlate COVID-19 and tourism indicators in Mexico

### Ciencia de redes para correlacionar COVID-19 e indicadores del turismo en México

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#### Abstract

In this paper we analyze tourism as complex system susceptible to external perturbations, like COVID-19 public health emergency. The research objective is to confirm pertinence of using transdisciplinary tools such as complexity approach and network analysis to understand and represent tourism occupancy dynamic. We used network science methodology to introduce an analysis that integrates two Mexican tourism industry indicators: Tourist Destinations occupancy rates and Hospitality-Gastronomy jobs; correlated with COVID-19 in Mexico pandemic indicator: Confirmed cases. The analysis results are based on centrality measures used to describe organizational patterns in tourism dynamic, besides we identified some

#### Resumen

En este artículo analizamos al turismo como un sistema complejo susceptible a perturbaciones externas, como la contingencia de salud COVID-19. El objetivo es confirmar la pertinencia de usar herramientas transdisciplinarias de complejidad y análisis de redes para entender y representar la dinámica de ocupación turística. Utilizamos una metodología con ciencia de redes para presentar un análisis que integra dos indicadores de la industria turística mexicana: Tasas de ocupación en destinos turísticos y Empleos de hospitalidad y gastronomía; correlacionados con el indicador de pandemia COVID-19 en México: Casos confirmados. Los hallazgos obtenidos se basan en medidas de centralidad usadas para describir los patrones de organización en la dinámica turística,

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generic properties of tourism occupancy distribution.

**Keywords:** Correlation, Data analysis, Network analysis, Systems engineering, Tourism.

**Introduction**

We applied network science field published in Science, 1999 and Nature, 2000 by Barabási; pertinent to analyse tourism (Scott et al., 2007); (Baggio, 2017); (Provenzano et al., 2018); (Arenas et al., 2019). Considering no published study has constructed yet complex networks that correlate:

- Mexican tourist destinations occupancy rates.
- Mexican Hospitality and Gastronomy Jobs.
- and Mexican COVID-19 statistics.

We justify network science application to analyse COVID-19 impacts on Mexican tourism, based on definition of complex systems as those with many interrelated compounds with difficulty to derive their collective behavior from an isolated knowledge of their components (Barabási, 2016).

Another complex network approach published on Nature by Albert et al. (2000) provides us with reasons to justify our subject belongs to complex systems order. To contribute understanding of tourism as complex system, susceptible to perturbations like COVID-19, having direct implications for destinations occupancy rates and jobs, enabling understanding from interacting components perspective; pertinent to consider significant tourism contribution with 8.7% of Mexico’s GDP (Gobierno de Mexico, 2019) and according to National Survey of Occupation and Employment (ENOE from its Spanish initials) first trimester 2019 employed population in tourism sector reached 4 million 246 thousand

**Table 1.**  
*Literature*

Application	Authors
Social networks	(Barabási, 2016)
Web search advertising in Google, Facebook, Twitter, LinkedIn, Cisco, Apple, Akamai	(Barabási, 2016)
Health	(International Human Genome Sequencing Consortium, 2001) (Venter et al., 2001) (Hopkins, 2008) (Gulbahce, Barabási, & Loscalzo, 2011)
Biology	(Oltvai & Barabási, 2004)
Medicine	(Gulbahce, Barabási, & Loscalzo, 2011)

y se identificaron algunas propiedades genéricas de distribución de la ocupación.

**Palabras clave:** Correlación, Análisis de datos, Analisis de Redes, Ingeniería de sistemas, Turismo.

direct jobs, meaning 8.7% of total employment nationwide ratifying tourism industry importance in mexican economy (Gobierno de Mexico, 2019).

In each section of the article, the reader will find:

- In Literature Review, the main trends and gaps in existing literatura
- In Methodology the description of networks following Power-Law mathematical formalism, the software used, analysis of each network, limitations of the method and technique used
- Results and Discussion about metrics for tourist destinations occupancy distributions; hospitality and gastronomy jobs; COVID-19 confirmed cases and implications.
- Conclusions describe research contribution, limitations and future directions.

**Literature Review**

We contribute with tourism data analytics using network science, emphasizing correlations among different databases. Proposing interdisciplinary approach for tourism studies. Network science, according to Barabási (2016) is possible because fast data sharing methods and cheap digital storage that made viable creation of network maps to describe behaviour of complex systems consisting of multiple interacting components. Since the size of most networks of practical interest have huge amount of data behind them; we consider tourism indicators can be mapped as a network.

Terrorism-military	(Do Valle et al., 2021) (Wilson, 2010) (Arquilla & Ronfeldt, 2001)
Epidemics	(Balcan et al., 2009) (Hufnagel, Brockmann, & Geisel, 2004) (Wang, Gonzalez, Hidalgo, & Barabasi, 2009)
Neuroscience	(Oh et al., 2014)
Management	(Sporns, Tononi, & Kötter, 2005) (Wu et al., 2008) (Scott, Cooper & Baggio, 2007)
Tourism	(Baggio, 2017) (Provenzano, Hawelka & Baggio, 2018) (Arenas et al., 2019)

#### Personal elaboration.

In summary, the main trends existing in network science literature relate to health, biology, medicine, epidemics and neuroscience; which give the context that physical systems are more frequently analyzed with network science, followed by technological applications; gaps remain on social complexity considering new drivers like employment, economic indicators, type of destinations that represent future research opportunities to broad current examples of network science applied to tourism that remain on state of the art, analyzing research lines, topics, authors, countries, to get the main trends in academic tourism research; instead we see pertinence and huge potential on analyzing with network science tourist routes, travel patterns, market segments, occupancy indicators, and elements that could provide inferences and be more illustrative of tourist consumption behaviour, travel decisions and consumer markets preferences that nowadays remains limited yet on network science applications.

#### Methodology

We applied network analysis based on graph theory (Barabási, 2002; Barabási & Albert, 1999; Watts, 2004; Watts & Strogatz, 1998); our results are representative to scale free networks theory that defines networks whose degree distribution follows a power law that persists in different network sizes (Barabási, 2016). Another theoretical argument congruent with our results is that in networks with power law degree distribution most nodes have only a few links, these numerous small nodes are held together by a few highly connected hubs (Barabási, 2016). In that way, the identification of those hubs in our results show the important role some states and tourist destinations have: driving strong

sustained travel demand; their contribution to Hospitality and Gastronomy jobs and COVID19 confirmed cases ranges (COVID.GOB, 2020).

Description of research methodology used begins creating architecture of the networks we want to analyse, then identify their organizing principles and express mathematical formalism behind them to contribute understanding of tourism as complex system.

Our networks model  $P(k)=ck^{(-\gamma)}$  follows empirical nature, focusing on data, function and utility; describing system's properties and behavior; like power law distribution (Barabási, 2016) revealing key information based on quantitative characterization; deepen in our case into occupancy rates, jobs and COVID-19 confirmed cases distributions on Mexican destinations (COVID.GOB, 2020), towards characterization of pandemic impacts on Mexican tourism industry dynamic.

Our networks distributions are represented by  $P(k) = ck^{-\gamma}$  for  $k_0 \leq k \leq K$  where:

- $c$  is an appropriate normalization factor.
- $\gamma$  is the exponent of connections distribution.
- $k_0$  is the minimum grade of any given node.
- $K$  the cut degree depending on the network size.

To prove usefulness of the used method, in Table 2 we compare two main networks models; emphasizing power-law pertinence for our study given its advantages.

**Table 2.**  
*Comparison Power-Law vs Poisson*

Model	Advantages	Disadvantages
Power-Law	<p>1. Clusters or hubs. Reveal key elements to understand the complex system behavior. That lead to identify:</p> <ul style="list-style-type: none"> <li>* Occupancy levels that replicate the most between destinations</li> <li>* Which destinations concentrate bulk of tourism, i.e., drive strong sustained travel demand</li> <li>* States classification according to Hospitality and Gastronomy employment ranges</li> <li>* States by COVID-19 confirmed cases ranges</li> <li>* States by employment and COVID19 confirmed cases ranges</li> </ul> <p>2. Topology with numerous small degree nodes coexisting with highly connected nodes. That in our study ratify cluster presence.</p> <p>3. Size of each node proportional to its degree. Lead to identify robust tourist destinations that constantly ensure relevant tourist consumption for Mexico and COVID-19 decreasing occupancy effects in tourist destinations.</p> <p>4. Many nodes with only few links. Lead to identify states and tourist destinations with low level ranges of:</p> <ul style="list-style-type: none"> <li>* Hospitality Gastronomy employment</li> <li>* COVID-19 confirmed cases</li> </ul> <p>5. Few clusters with more links. Lead to identify states and tourist destinations with high level ranges of:</p> <ul style="list-style-type: none"> <li>* Hospitality and Gastronomy employment</li> <li>* COVID-19 confirmed cases</li> </ul> <p>6. Lack scale characteristic, congruent with most networks representative of socio economic complex systems</p> <p>7. Number of links a node can have is not restricted, consistent with most real socio economic networks in which elements have multiple interactions.</p>	<p>1. Fragility in network topology when removing clusters. For our study purposes, this “disadvantage” works in our favor as it confirms our results regarding the important role some tourist destinations have, that we might consider to better understand Mexican tourism industry dynamic.</p>
Poisson or Random networks	<p>1. Robust network topology to random elimination of nodes. Contrary to our study purposes of identifying most important states and tourist destinations in terms of occupancy, hospitality and Gastronomy employment as well as COVID-19 confirmed cases.</p>	<p>1. Most nodes have same number of links which is not consistent with our created networks</p> <p>2. Restricted to a characteristic scale, which is not consistent with most real socio economical networks.</p> <p>3. Hubs absence, meaning not having highly connected nodes denying roles importance between states and tourist destinations.</p> <p>4. Limits the number of links a node can have. Contrary to our findings in tourist networks.</p>

Personal elaboration.

Since network science emphasizes correlations and interactions among different databases, to describe behaviour of tourism as complex system, we elaborate network maps about:

1. Mexican tourism industry indicators:

- 1.1 Destinations occupancy rates
- 1.2 Hospitality and Gastronomy jobs

2. COVID-19 in Mexico indicator:

- 2.1 Confirmed cases

We used Netdraw Ucinet software to elaborate network maps (Borgatti et al., 2002) having links between nodes to indicate existent interactions.

UCINET for Windows is a software package for the analysis of network data. It was developed by Lin Freeman, Martin Everett and Steve Borgatti on 2002. It comes with the NetDraw network visualization tool, that we used to create and analyze our networks.

1. Networks about mexican tourism industry indicators:

- 1.1. Destinations occupancy rates. First interaction is about tourist destinations and their occupancy rate registered on certain date. Figure 1.

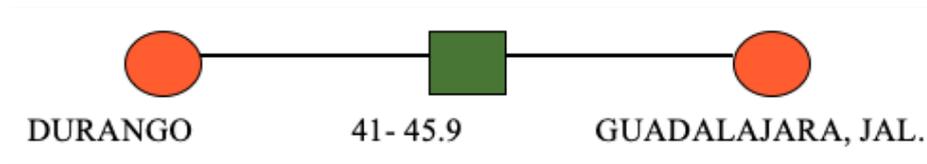


Figure 1. Tourist destinations and its occupancy rate. Personal elaboration.

Second type: occupancy rates clusters on certain dates, and tourist destinations belonging to those clusters. Figure 2.

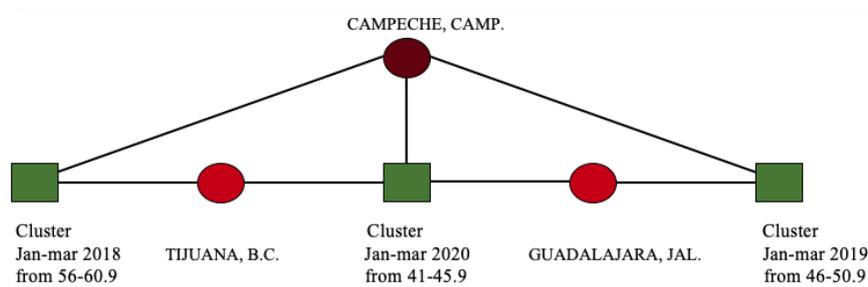


Figure 2. Tourist destinations by occupancy rates clusters. Personal elaboration.

For indicators: *Hospitality and Gastronomy jobs* as well as *COVID-19 Confirmed cases*, given INEGI (2020) and COVID.GOB (2020) data

sources are displayed by state; Figure 3 specifies correspondence between states and tourist destinations.

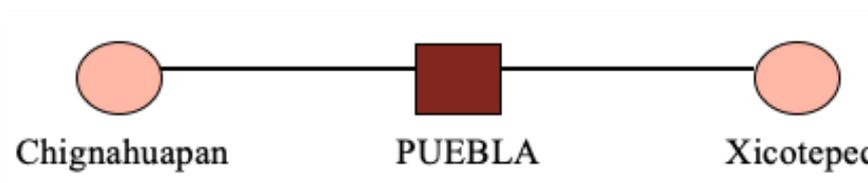
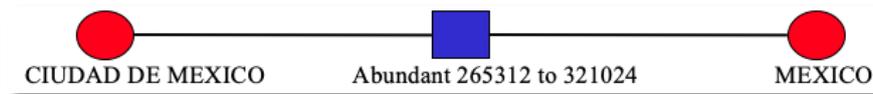


Figure 3. Tourist destinations by state. Personal elaboration.

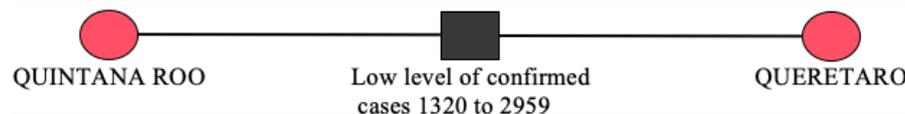
1.2. *Hospitality and Gastronomy jobs*. Figure 4 about states and their employment range to April 21<sup>st</sup> 2020.



**Figure 4.** States and their employment range. Personal elaboration.

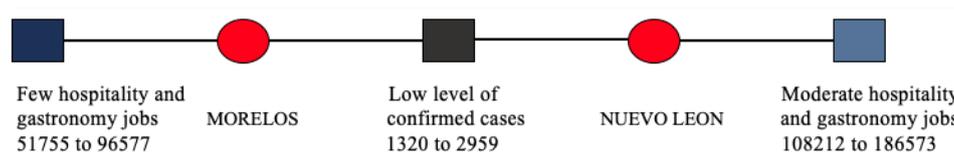
2. For *COVID-19* indicator:

2.1 *Confirmed cases*. Figure 5. States by confirmed cases ranges 11<sup>th</sup> June 2020.



**Figure 5.** Confirmed cases range by state. Personal elaboration.

For integral perspective Figure 6 integrates both jobs and confirmed cases ranges, with their corresponding states.



**Figure 6.** States by jobs and confirmed cases ranges. Personal elaboration.

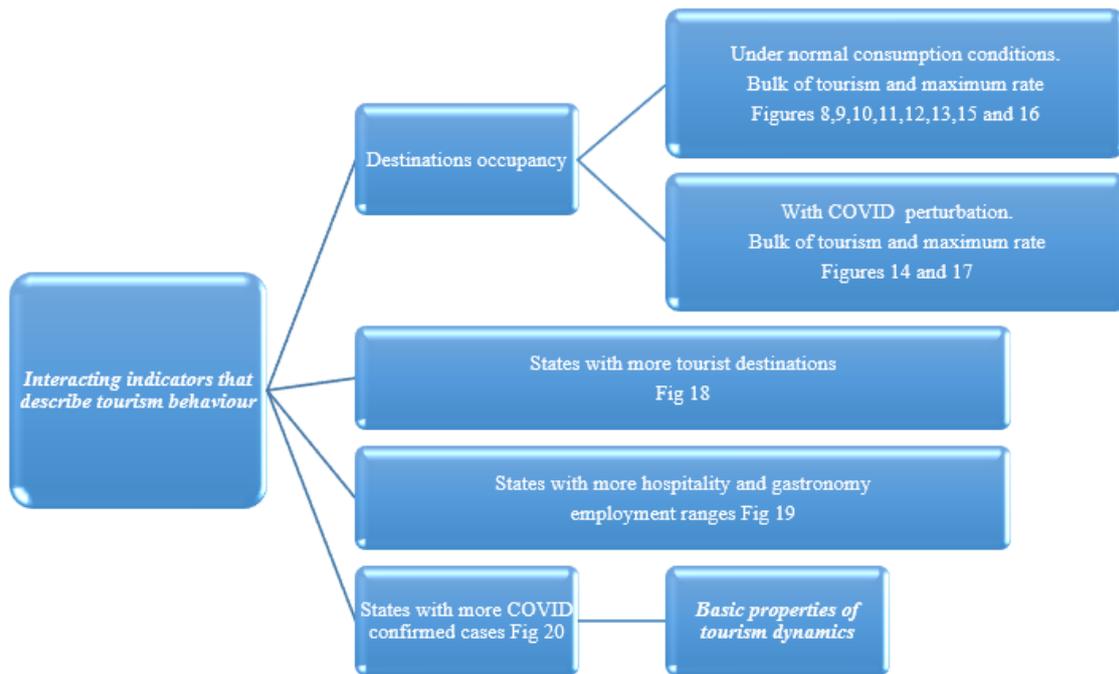
**Limitations of the method and technique**

Relies on accurate data to build the networks, real data may be incomplete, uncertain, or non available; another challenge is to choose indicators or drivers that enable accurate analysis; specifically time consuming and demanding to prepare relational data to interpret causality.

**Results and Discussion**

Since the contribution of network maps is to describe the detailed behaviour of a system consisting of various interacting components. The findings for each indicator are as follows.

Figure 7 offers structure of analysis findings.



**Figure 7.** Results. Personal elaboration.

Results:

1. On networks about *mexican tourism industry indicators*:

- 1.1. *Destinations and occupancy rates.* Bipartite networks (Figure 1) which first set of nodes are 70 mexican tourist destinations; and second set occupancy rates each destination had from January-May 2020, 2019 and 2018 (DATATUR, 2020, 2019, 2018).

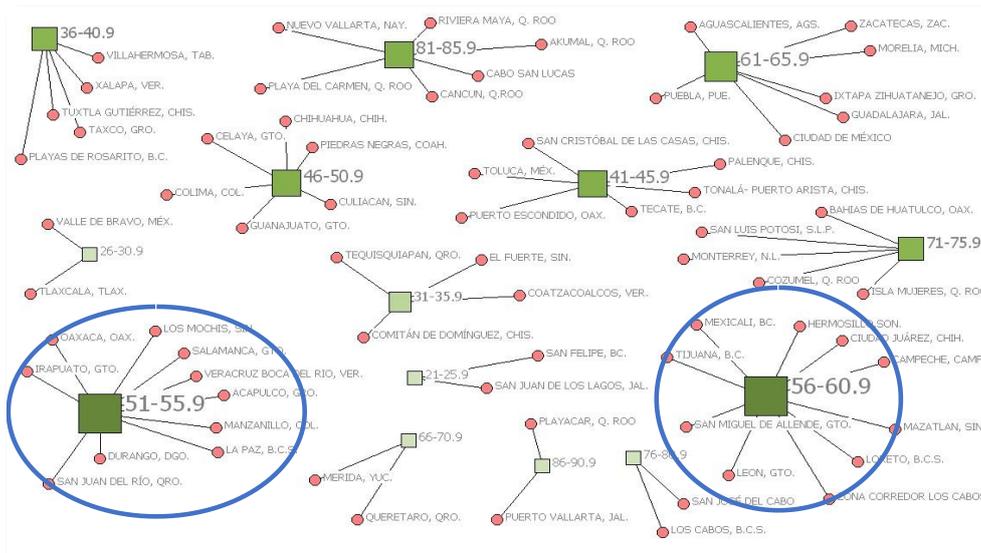
Considering in Mexico flight suspensions, self-isolation and quarantine began entirely on april 2020, first graphs for this research illustrate January-March accumulated rates in 2018, 2019 and 2020 (Figures 8-10) to evidence how mexican tourist destinations registered occupancy rates under normal consumption conditions without COVID-19.

After running Analytic Technologies Harvard software on 2-Mode Centrality (Borgatti et al., 2002) results found Highest Degree Centrality

for occupancy rates between 51-60.9 on January to March 2018 (Figure 8).

That degree centrality identified in Figure 8 with blue circles is important because it shows from January-March 2018, under normal consumption conditions, occupancy rates that replicate the most between destinations are 51-60.9 per cent concentrating bulk of tourism on 20 destinations: Los Mochis, Sin; Salamanca, Gto; Veracruz Boca del Rio, Ver; Acapulco, Gro; Manzanillo, Col; La Paz, B.C.S; Durango, Dgo; San Juan del Río, Qro; Irapuato, Gto; Oaxaca, Oax; Hermosillo, Son; Ciudad Juarez, Chih; Campeche, Camp; Mazatlan, Sin; Loreto, B.C.S; Zona Corredor Los Cabos; León, Gto; San Miguel de Allende, Gto; Tijuana, B.C and Mexicali, B.C. that registered referred occupancy.

Another observation is that maximum occupancy rate for same period was 86-90.9 registered by two destinations: Playacar, Q. Roo and Puerto Vallarta, Jal. (Figure 8).

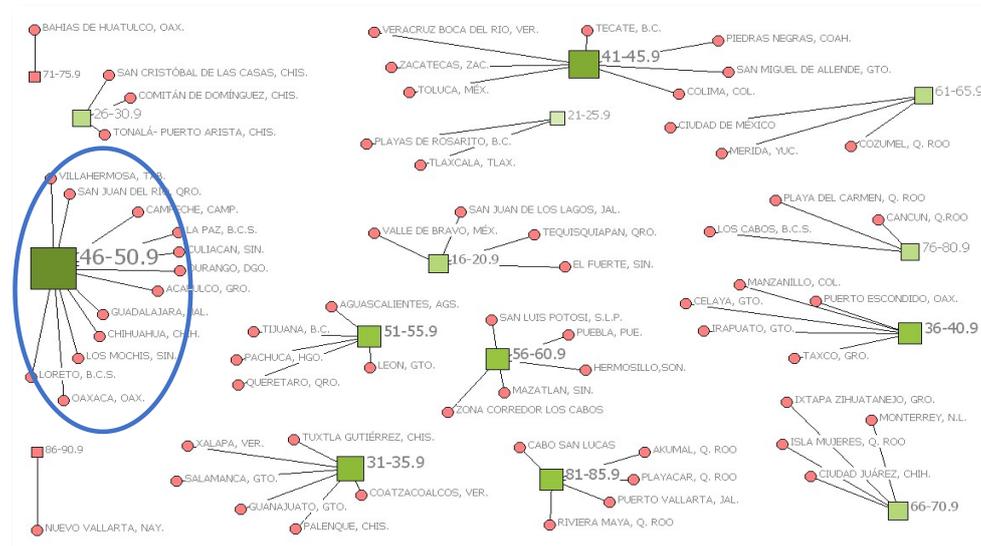


**Figure 8.** Degree centrality for accumulated occupancy January-March 2018. Personal elaboration.

On 2-Mode Centrality analysis (Borgatti et al., 2002) January-March 2019 we found Highest Degree Centrality for occupancy rates between 46-50.9 (Figure 9).

rates between 46-50.9 concentrated bulk of tourism in: Villahermosa, Tab; San Juan del Rio, Qro; Campeche, Camp; La Paz, B.C.S; Culiacan, Sin; Durango, Dgo; Acapulco, Gro; Guadalajara, Jal; Chihuahua, Chih; Los Mochis, Sin; Oaxaca, Oax and Loreto, B.S.C. And having maximum occupancy for the same period 86-90.9 registered by Nuevo Vallarta, Nay (Figure 9).

Deegree centrality circled in blue, Figure 9 on January-March 2019 under normal consumption conditions, 12 destinations replicate occupancy



**Figure 9.** Degree centrality for accumulated occupancy January-March 2019. Personal elaboration.

On 2-Mode Centrality analysis (Borgatti et al., 2002) January-March 2020 COVID decreasing occupancy effects in mexican destinations became visible, given flight suspensions and measures including self-isolation were applied in Mexico’s travel market sources like United

States and European countries; thus Highest Degree Centrality for occupancy rates was 36-45.9 (Figure 10) on 22 destinations: Taxco, Gro; Puerto Escondido Oax; San Juan del Río, Qro; Chihuahua, Chih; Toluca, Mex; Loreto, B.C.S; Xalapa, Ver; Piedras Negras, Coah; León Gto;

Manzanillo, Col; Zacatecas, Zac; Durango, Dgo; Tijuana, B.C; San Luis Potosi, S.L.P; Queretaro, Qro; Aguascalientes, Ags; Veracruz Boca del Rio, Ver; Villahermosa, Tab; Guadalajara, Jal; Culiacan, Sin; Oaxaca, Oax; and Campeche, Camp.

COVID-19 decreasing occupancy effects is confirmed again in Nuevo Vallarta, Nay; that in same period of previous year registered maximum occupancy 86-90.9 (Figure 9) decreasing 10 percent by January-March 2020 with maximum occupancy 76-80.9 (Figure 10).

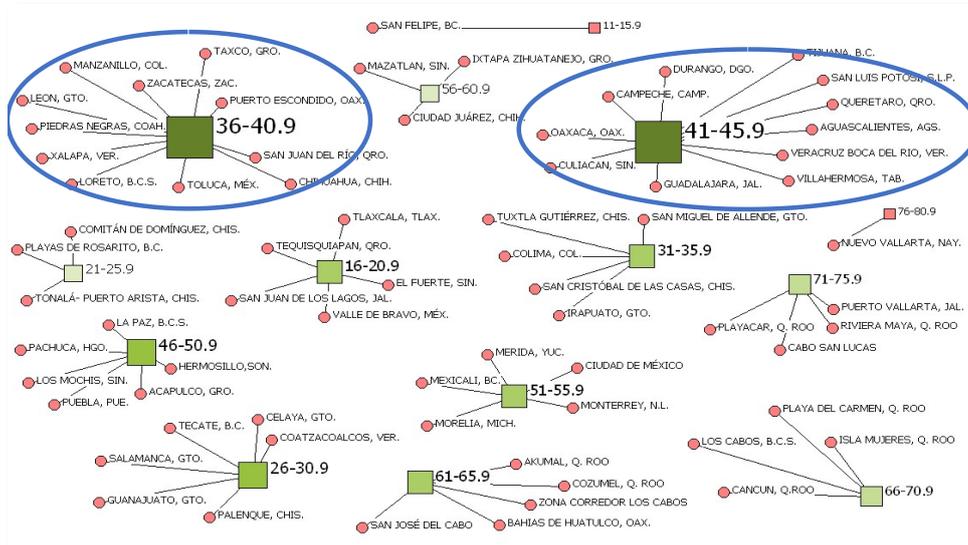


Figure 10. Degree centrality for accumulated occupancy January-March 2020. Personal elaboration.

Deepening analysis January-March accumulated rates 2018, 2019 and 2020 (Figures 8-10) a fourth network map (Figure 11) was built from second type of interaction represented in Figure 2 focusing on destinations that concentrated bulk of tourism in three periods:

- 20 destinations January-March 2018
- 12 destinations January-March 2019

- 22 destinations January-March 2020

Finding that destinations represented with red circle nodes, but mostly: Loreto, B.C.S; Campeche, Camp; San Juan del Río, Qro; Oaxaca, Oax and Durango, Dgo. represented with brown circle nodes are robust destinations that constantly ensure relevant tourist consumption for Mexico (Figure 11).

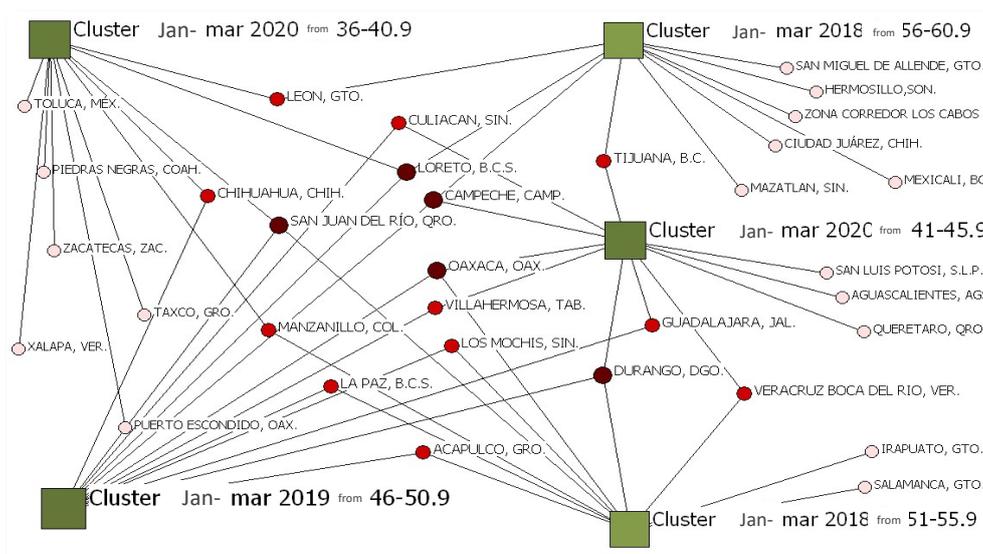
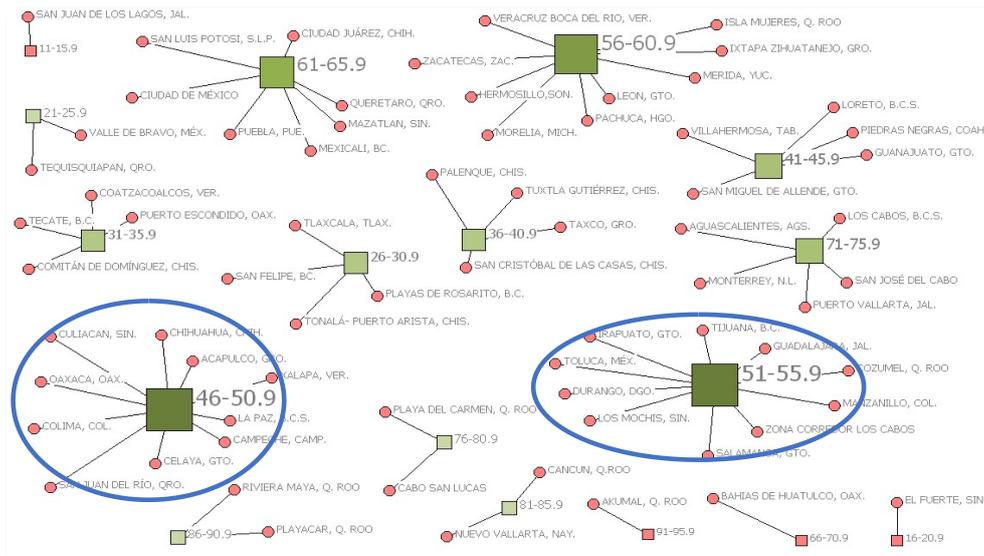


Figure 11. Destinations that concentrated bulk of tourism January-March 2018, 2019, 2020. Personal elaboration.

April and May analysis was done separately to get information about COVID-19 decreasing occupancy effects; considering in Mexico during those months in 2020 measures including flight suspensions, self-isolation and quarantine prevailed throughout whole country territory.

Figure 12 corresponds April 2018 analysis for previous occupancy rates registered by destinations under normal consumption conditions without COVID-19. Finding Highest Degree Centrality for occupancy rates 46-55.9;

concentrated greater amount of tourism flow on 20 destinations: Chihuahua, Chih; Acapulco, Gro; Xalapa, Ver; La Paz, B.C.S; Campeche, Camp; Celaya, Gto; San Juan del Rio, Qro; Colima, Col; Oaxaca, Oax; Culiacan, Sin; Tijuana B.C; Guadalajara, Jal; Cozumel, Q. Roo; Manzanillo, Col; Zona Corredor Los Cabos; Salamanca, Gto; Los Mochis, Sin; Durango, Dgo; Toluca, Mex and Irapuato, Gto. And maximum occupancy rate 91-95.9 registered on Akumal, Q.Roo.



**Figure 12.** Degree centrality April 2018. Personal elaboration.

Likewise, Figure 13 corresponds to April 2019 analysis for previous occupancy rates registered by destinations under normal consumption conditions without COVID-19. Having found Highest Degree Centrality for occupancy rates 41-45.9 and 61-65.9; i.e having concentrated greater amount of tourism flow on 21 destinations: Mexicali, B.C; Zacatecas, Zac; San Jose del Cabo; Queretaro, Qro; Ciudad de

Mexico; Merida, Yuc; Loreto, B.C.S; Durango, Dgo; Bahias de Huatulco, Oax; Aguascalientes, Ags; Isla Mujeres, Q.Roo; Culiacan, Sin; Tecate, B.C; Comitán de Domínguez, Chis; Tuxtla Gutiérrez, Chis; Puerto Escondido, Oax; Piedras Negras, Coah; Taxco, Gro; San Cristobal de las casas, Chis; Guanajuato, Gto and San Miguel de Allende Gto. And maximum occupancy rate 86-90.9 registered in Playacar, Q.Roo

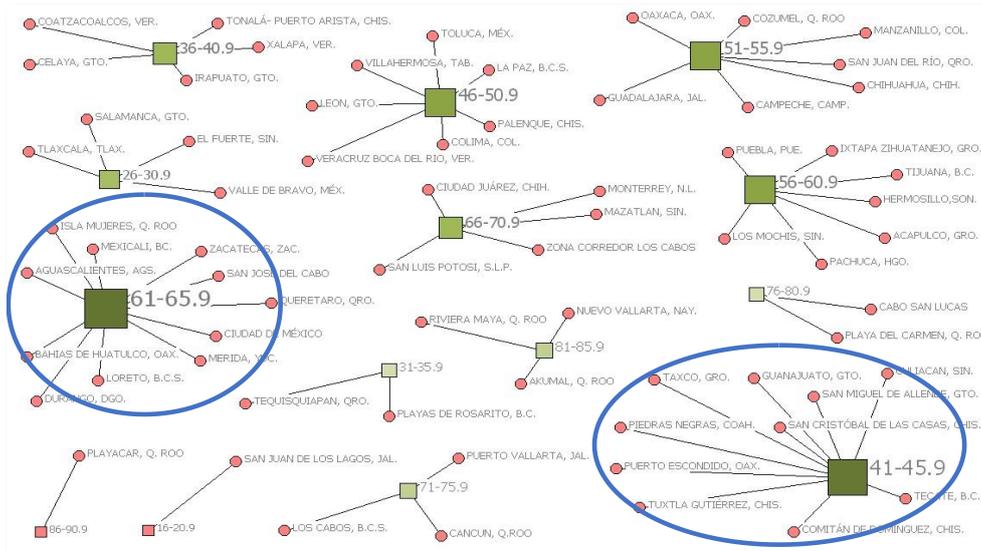


Figure 13. Degree centrality April 2019. Personal elaboration.

2-Mode Centrality analysis (Borgatti et al., 2002) for April 2020 COVID-19 decreasing occupancy effects in destinations is clearly visible, having Highest Degree Centrality for occupancy rates 0-

5.9 in most destinations; an unprecedented situation with highest occupancy rate registered by Mazatlan, Sin. 16-20.9 (Figure 14).

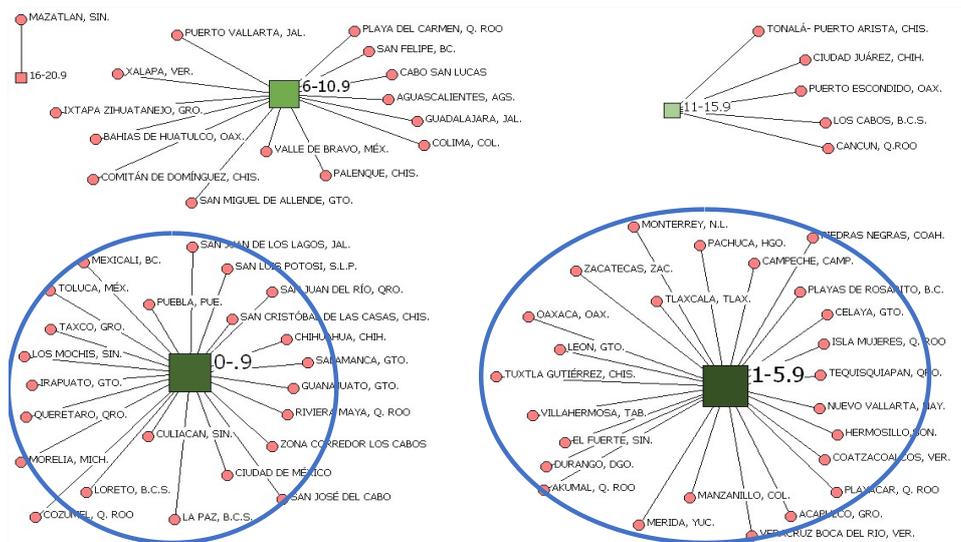
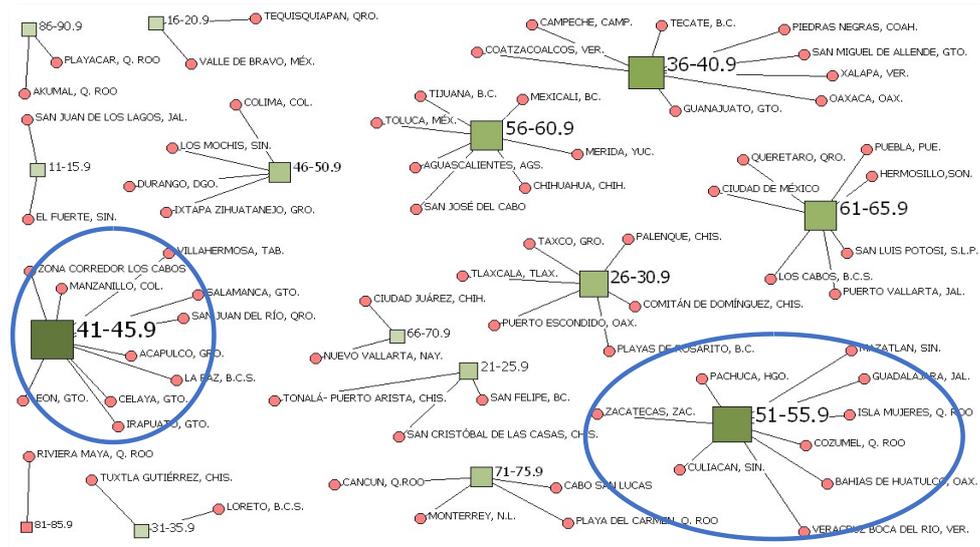


Figure 14. Degree centrality on April 2020. Personal elaboration.

May analysis was done separately to get information about COVID-19 decreasing occupancy effects in destinations.

Figure 15 corresponds to May 2018 analysis referring previous occupancy rates registered under normal consumption conditions without COVID-19. Having found Highest Degree Centrality for occupancy rates 41-45.9 and 51-55.9; i.e concentrated greater amount of tourism flow on 19 destinations: Zona Corredor Los

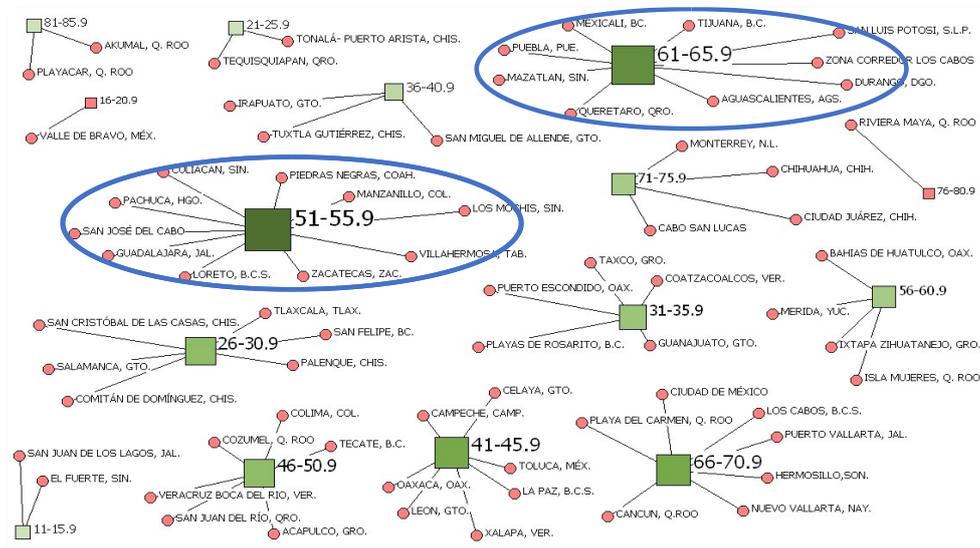
Cabos; Manzanillo, Col; Villahermosa, Tab; Salamanca, Gto; San Juan del Río, Qro; Acapulco, Gro; La Paz, B.C.S; Celaya, Gto; Irapuato, Gto; Leon, Gto; Pachuca, Hgo; Mazatlan, Sin; Guadalajara, Jal; Isla Mujeres, Q.Roo; Cozumel, Q. Roo; Bahias de Huatulco, Oax; Veracruz Boca del Rio, Ver; Culiacan, Sin and Zacatecas, Zac. With the maximum occupancy rate from 86 to 90.9 reported by 2 Q. Roo destinations: Playacar and Akumal.



**Figure 15.** Degree centrality on May 2018.  
Personal elaboration.

Figure 16 corresponds to May 2019 analysis referring previous occupancy rates under normal consumption conditions without COVID-19. Having found Highest Degree Centrality for occupancy rates 51-55.9 and 61-65.9; concentrating greater amount of tourism flow on 19 destinations: Piedras Negras, Coah; Manzanillo, Col; Los Mochis, Sin; Villahermosa, Tab; Zacatecas, Zac; Loreto, B.C.S; Guadalajara, Jal; San Jose del Cabo; Pachuca, Hgo; Culiacan, Sin; Tijuana, B.C; San Lis Potosi, S.L.P; Zona Corredor Los Cabos; Durango, Dgo; Aguascalientes, Ags; Queretaro, Qro; Mazatlan, Sin; Puebla, Pue and Mexicali, BC. With the maximum occupancy rate 81-85.9 reported again by 2 Q. Roo destinations in the same month of previous year: Playacar and Akumal.

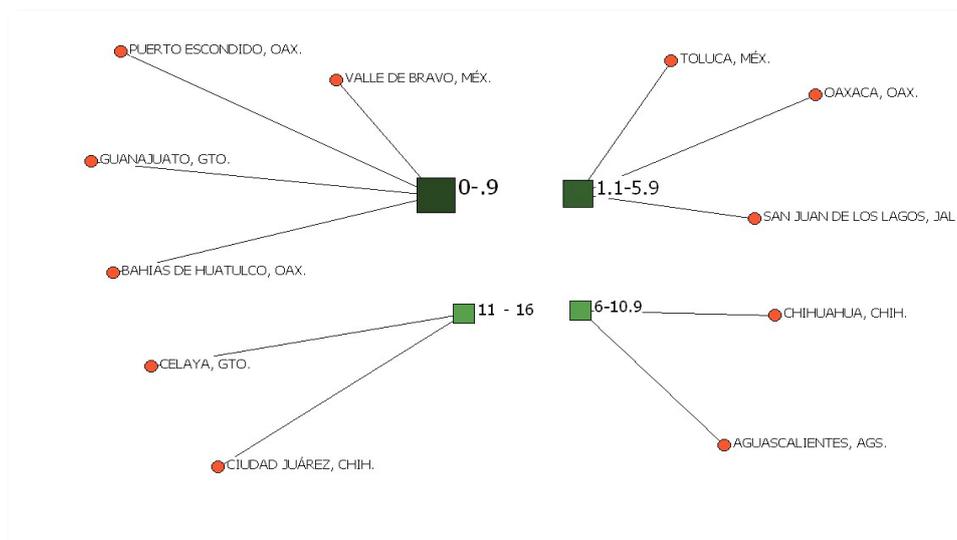
Jal; San Jose del Cabo; Pachuca, Hgo; Culiacan, Sin; Tijuana, B.C; San Lis Potosi, S.L.P; Zona Corredor Los Cabos; Durango, Dgo; Aguascalientes, Ags; Queretaro, Qro; Mazatlan, Sin; Puebla, Pue and Mexicali, BC. With the maximum occupancy rate 81-85.9 reported again by 2 Q. Roo destinations in the same month of previous year: Playacar and Akumal.



**Figure 16.** Degree centrality on May 2019.  
Personal elaboration.

For May 2020 COVID-19 pandemic decreasing occupancy effects were exacerbated, nullifying tourism activity in most destinations and registering Highest Degree Centrality for occupancy rates 0-5.9 in 7 destinations: Toluca,

Mex; Oaxaca, Oax; San Juan de los Lagos, Jal; Bahias de Huatulco, Oax; Guanajuato, Gto; Puerto Escondido, Oax and Valle de Bravo, Mex. With maximum occupancy 11-16 on Celaya, Gto and Ciudad Juarez, Chih (Figure 17).



**Figure 17.** Degree centrality on May 2020. Personal elaboration.

The most important metric for our research purpose is Highest Degree Centrality for occupancy rates in figures 8-17, given we looked for destinations that concentrated bulk of tourism and maximum occupancy levels registered. We

generated those data using Analytic Technologies Harvard software on 2-Mode Centrality (Borgatti et al., 2002). The analysis generated other 4 metrics that support our metric of interest, which is degree centrality (Table 3).

**Table 3.** Metrics for tourist destinations that concentrated bulk of tourism january-march 2018, 2019 and 2020

Cluster	Occupancy range	Degree	2-Local	Eigenvector	Closeness	Betweenness
jan-mar 2020	36-40.9	0.157142863	0.024693878	0.281663418	0.838709652	0.088587321
jan-mar 2020	41-45.9	0.157142863	0.024693878	0.486292988	0.787878811	0.063163474
jan-mar 2019	46-50.9	0.171428576	0.029387757	0.648508668	0.939759016	0.079402491
jan-mar 2018	51-55.9	0.142857149	0.020408165	0.463044554	0.772277236	0.049962241
jan-mar 2018	56-60.9	0.142857149	0.020408165	0.221835926	0.838709652	0.08558818

Personal elaboration using Ucinet (Borgatti et al., 2002).

Degree, consists of the sums of ties values, meaning most common occupancy level registered by destinations across all periods analysed is 46-50.9%. Complementary metrics: 2-Local represents our mode network as bipartite graph with balanced incoming and outgoing links. Eigenvector, calculates eigenvector of the largest positive eigenvalue as measure of centrality, ratifying robustness. Closeness is a metric that gives the overall network closeness centralization and is useful to measure distance by sums of the lengths of all the paths or all the trails; a metric that can be thought as an index of the expected time-until-arrival for things flowing through the network via optimal paths. Betweenness is a measure of information control. Highest values in all metrics support our finding that destinations represented with brown circle node linked to jan-mar 2019 cluster, are robust destinations that constantly ensure tourist

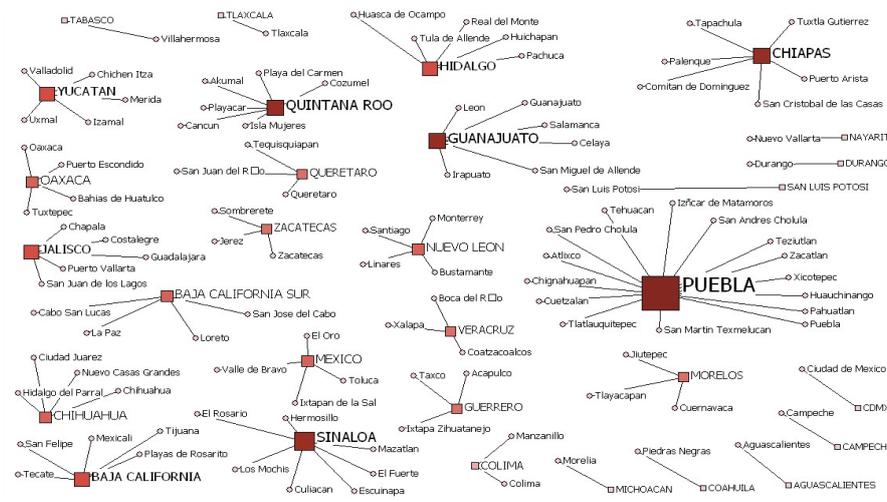
consumption for Mexico; represented in tourism behavioral dynamic (figure 11).

Although it is necessary to carry out more in-depth analysis integrating other indicators to quantify correlations degree; as well as verifiable effective incentives application; both are beyond this research paper scope. However, we have identified some essential characteristics and destinations that concentrate bulk of tourism that might be considered when focusing marketing intelligence initiatives and public-private partnerships.

Having concluded analysis for the first Mexican tourism industry indicator: Destinations occupancy rates (Figures 8-17); before continuing with the rest indicators Hospitality and Gastronomy jobs and COVID-19 Confirmed cases, given INEGI and COVID.GOB primary data sources are displayed by state; Figure 18

was built following type of interaction in Figure 3. To specify correspondence between states of the republic and tourist destinations; even though

in Figures 8-17, names of the corresponding states were abbreviated after name of tourist destination.



**Figure 18.** Correspondence between states of the republic and tourist destinations. Personal elaboration.

Analysis for states of the republic reveals highest degree for Puebla, supporting is the state with most tourist destinations (Table 4).

**Table 4.** Correspondence degree between states and tourist destinations

State	Degree
Aguascalientes	0.009346
Baja California	0.046729
Baja California Sur	0.037383
Campeche	0.009346
Coahuila	0.009346
Colima	0.018692
Chiapas	0.056075
Chihuahua	0.037383
CdMx	0.009346
Durango	0.009346
Guanajuato	0.056075
Guerrero	0.028037
Hidalgo	0.046729
Jalisco	0.046729
Mexico	0.037383
Michoacan	0.009346
Morelos	0.028037
Nayarit	0.009346
Nuevo Leon	0.037383
Oaxaca	0.037383
<b>Puebla</b>	<b>0.140187</b>
Queretaro	0.028037
Quintana Roo	0.056075
San Luis Potosi	0.009346
Sinaloa	0.065421
Tabasco	0.009346
Tlaxcala	0.009346
Veracruz	0.028037
Yucatán	0.046729
Zacatecas	0.028037

Personal elaboration using Ucinet (Borgatti et al., 2002).

Identify States of the Republic with more tourist destinations, is useful to propose focalized restart of tourism after COVID-19.

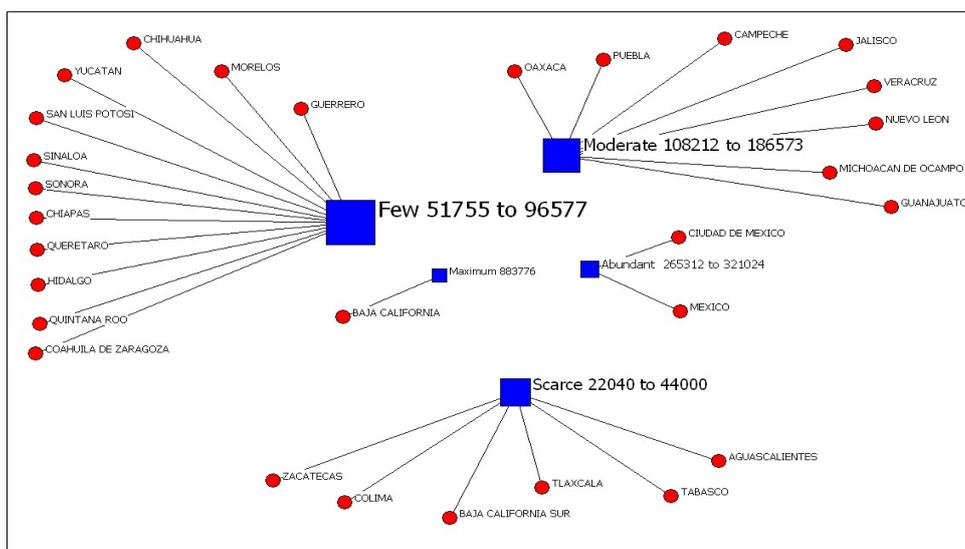
The next mexican tourism industry indicator for this research analysis is:

*Hospitality and Gastronomy jobs.* Bipartite: states-employment ranges network was built to connect data following type of interaction in Figure 4.

After running Analytic Technologies Harvard software 2-Mode Centrality (Borgatti et al., 2002) for Hospitality and Gastronomy jobs in

Mexican territory by April 21<sup>st</sup> 2020, five employment ranges were identified from Scarce to Maximum; finding considerable number of states and therefore tourist destinations classify on Few employment range 51755-96577 in contrast Maximum range 883776 hospitality and gastronomy jobs reported by Baja California state (Figure 19) with its 5 tourist destinations: Tecate, San Felipe, Mexicali, Tijuana and Playas de Rosarito.

Our Network analysis allows sizing and graphically represent number of Hospitality and Gastronomy jobs affected in Mexico by COVID-19.



**Figure 19.** States by Hospitality and gastronomy employment ranges. Personal elaboration.

Our finding about most states classifying on Few employment range is supported by software

metrics with .40 degree, .16 on 2-mode local linkage and 1 eigenvector robustness.

**Table 5.** Metrics for states by hospitality and gastronomy employment ranges

Employment	Degree	2-Local	Eigenvector
Maximun 883776	0.033333335	0.001111111	0
Abundant 265312 to 321024	0.066666667	0.004444445	0
Moderate 108212 to 186573	0.266666681	0.071111113	8.27E-08
Few 51755 to 96577	0.400000006	0.160000026	1
Scarce 22040 to 44000	0.200000003	0.040000003	6.76E-16

Personal elaboration using Ucinet (Borgatti et al., 2002).

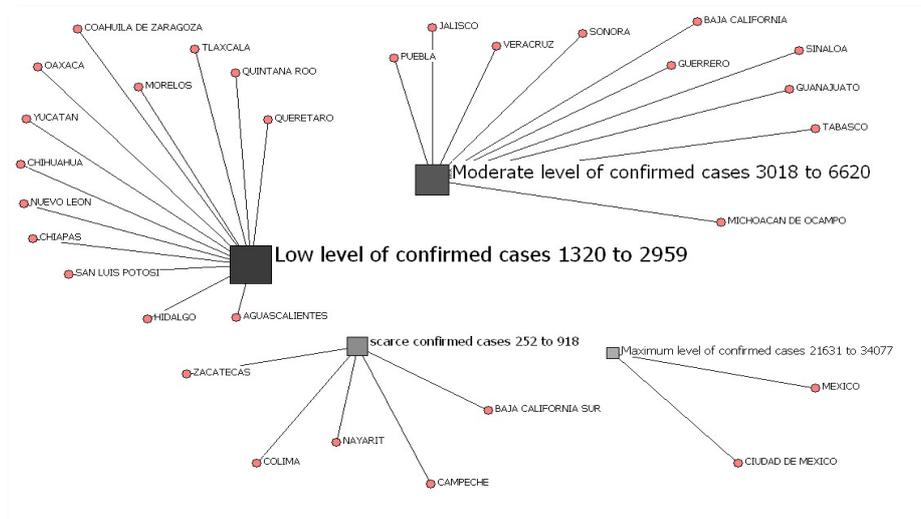
Having concluded mexican tourism industry indicators; the last set analyzed is COVID-19 indicator:

*Confirmed cases.* Bipartite: states-confirmed cases ranges network was built to connect data following type of interaction in Figure 5.

After running software 2-Mode Centrality (Borgatti et al., 2002) for COVID-19 confirmed cases in Mexico by 11<sup>th</sup> June 2020, four ranges were identified from Scarce to Maximum; finding that considerable number of states and therefore tourist destinations classify on Low level range of confirmed cases 1320-2959 compared to Maximum range 21631-34077

COVID-19 confirmed cases reported by Mexico state and Ciudad de Mexico (Figure 20) and their corresponding 5 tourist destinations: El Oro, Toluca, Ixtapan de la Sal, Valle de Bravo and CDMX. Useful information for responsible

tourism restart having identified the most and the least infected destinations, crucial to restoring trust and confidence in the sector focalizing promotional campaigns and tourism product development initiatives.



**Figure 20.** States by COVID-19 confirmed cases ranges. Personal elaboration.

Our finding about most states classifying Low level confirmed cases is supported by software metrics with .43 degree and .18 on 2-mode local

linkage. Consistent with early stages of pandemic in Mexico.

**Table 6.** Metrics for states by COVID-19 confirmed cases ranges

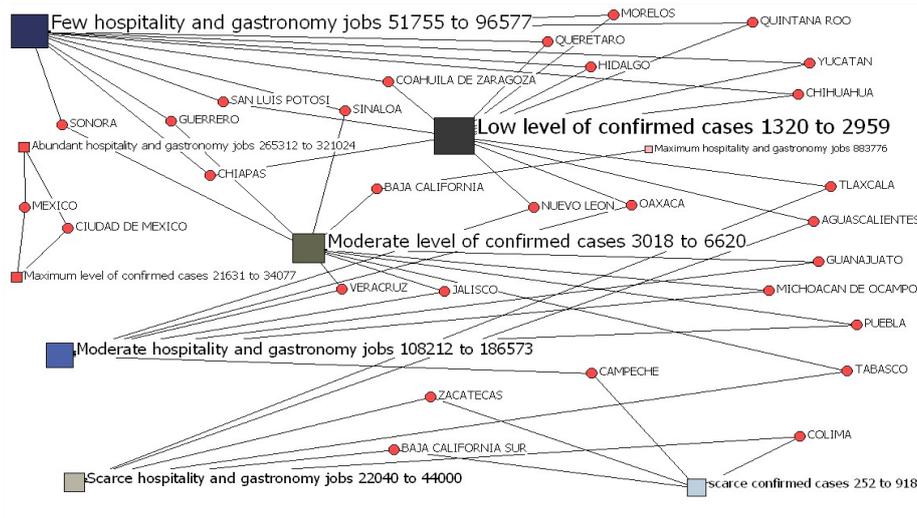
Range	Degree	2-Local
Maximum level of confirmed cases 21631 to 34077	0.06666667	0.004444445
Moderate level of confirmed cases 3018 to 6620	0.333333343	0.111111097
Low level of confirmed cases 1320 to 2959	0.433333337	0.187777787
Scarce confirmed cases 252 to 918	0.166666672	0.027777778

Personal elaboration using Ucinet (Borgatti et al., 2002).

Deepen into findings for Mexico’s Hospitality and Gastronomy jobs and COVID-19 Confirmed cases (Figures 19 and 20); network map on Figure 21 was built to have integral perspective considering type of interaction in Figure 6 regarding both jobs and confirmed cases ranges, with their corresponding states.

confirmed cases; likewise Baja California reporting moderate confirmed cases and maximum hospitality and gastronomy jobs; furthermore most states and destinations report low level COVID confirmed cases (Figure 21). Besides occupancy pattern in Oaxaca and Campeche evidencing their role as generators of sustained tourism flow (Figure 11). In fact, on June 22nd Campeche obtained the Safe Travel Stamp from the World Travel and Tourism Council (WTTC) because of sanitary protocols standardization in hotels, restaurants, tour operators and other tourism service providers; hence the first POSTCOVID Corridor in Latin America was inaugurated in Mexico integrated by Campeche, Yucatan and Quintana Roo destinations (Mexico desconocido, s.f).

Findings confirm COVID deep negative impacts particularly for Mexico and Ciudad de Mexico CDMX, having maximum level of confirmed cases and abundant hospitality and gastronomy jobs affected. However, outcomes for overcoming pandemic are observed on Campeche that corresponds to moderate hospitality and gastronomy jobs and scarce COVID confirmed cases; also Nuevo Leon and Oaxaca with moderate employment and low



**Figure 21.** States by employment and COVID19 confirmed cases ranges. Personal elaboration.

Most states according to software analysis classified Low level of confirmed cases and Few hospitality and gastronomy jobs with degree metrics .43 and .40; as well as .18 and .16 on 2-mode local linkage. Probing correlation between confirmed cases and employment rate; verifiable on lowest degree and 2-Local metrics for Maximum hospitality and gastronomy jobs as well as confirmed cases; finding there are more cases per capita in densely populated areas.

Even though it is out of scope of this paper, some insights for most affected areas providing emergency economic assistance through monetary measures like credit lines at reduced rate or exemption/reduction of social security contributions, wage subsidies or special support mechanisms for hospitality and gastronomy jobs might be helpful.

**Table 7.** Metrics for States by employment and COVID19 confirmed cases ranges

Range	Degree	2-Local
Maximum level of confirmed cases 21631 to 34077	0.06666667	0.004444445
Moderate level of confirmed cases 3018 to 6620	0.333333343	0.111111097
Low level of confirmed cases 1320 to 2959	0.433333337	0.187777787
Scarce confirmed cases 252 to 918	0.166666672	0.02777778
Maximum hospitality and gastronomy jobs 883776	0.033333335	0.001111111
Abundant hospitality and gastronomy jobs 265312 to 321024	0.06666667	0.004444445
Moderate hospitality and gastronomy jobs 108212 to 186573	0.266666681	0.071111113
Few hospitality and gastronomy jobs 51755 to 96577	0.400000006	0.160000026
Scarce hospitality and gastronomy jobs 22040 to 44000	0.200000003	0.040000003

Personal elaboration using Ucinet (Borgatti et al., 2002).

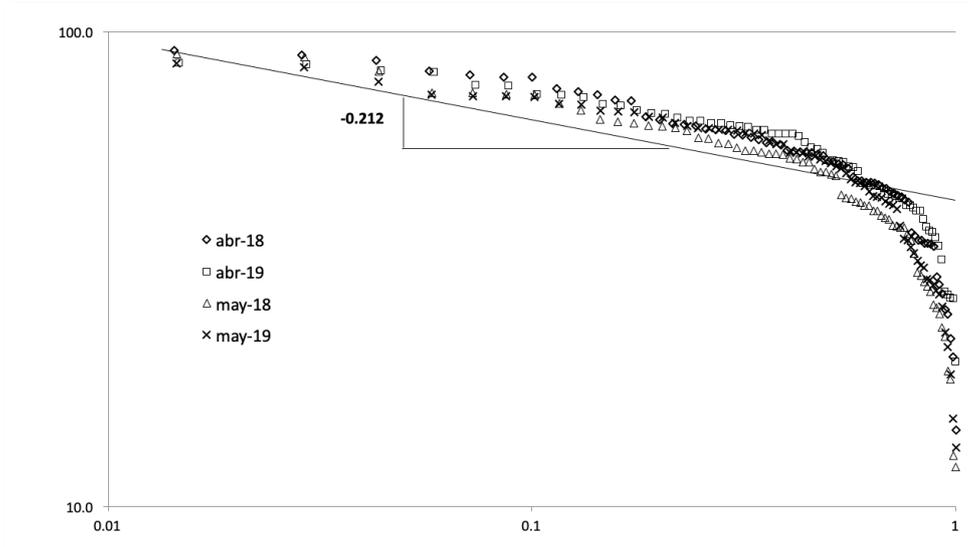
To complement our study we support our findings with quantitative characterization of our networks, given networks distributions reveal information towards better understanding of tourism mobility dynamic during analyzed periods.

conditions without COVID-19 visited destinations that concentrate bulk of tourism behave according to power law.

$$P(V > v) = 1 - F(V \leq v) = \left(\frac{M}{v}\right)^\alpha \quad (1)$$

We analyzed occupancy levels on different months and years. Finding that under normal

Conserving same statistical distribution regardless year or month of the information (Figure 22).



**Figure 22.** occupancy levels distributions in Mexico. Personal elaboration.

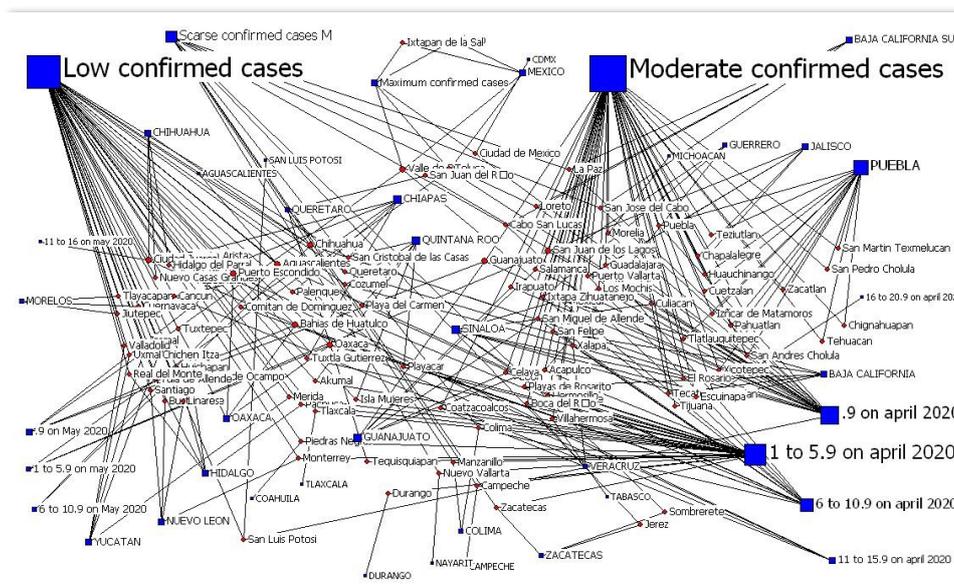
Regardless each destination conditions, we found statistical similarity of visitors distribution among different periods. Which supports two generic properties seen in social networks: alien to single characteristic scale and high clustering degree. Implying small destinations are organized hierarchically into larger groups, maintaining free-scale topology, following power law distribution.

$$P(k) = ck^{-\gamma} \quad k_0 \leq k \leq K \quad (2)$$

Our interpretation of scale free and scale invariance generic properties found is that tourism occupancy is preserved regardless period

or destination type; another finding is that distributions confirm tourism occupancy is not random. And we consider it is one of the firsts steps to understand underlying dynamic of tourism as complex system.

On Figure 23 we analyzed correlation between confirmed cases and reduction in tourism, finding by may 2020 moderate level of confirmed cases prevailed among destinations with reduction in tourism occupancy from 1-5.9 level. Identifying that Puebla state occupancy, was the most affected.



**Figure 23.** COVID-19 confirmed cases and occupancy reduction. Personal elaboration.

Highest degree measures found by software: .42 for moderate confirmed cases; .23 for 1-5.9 occupancy and .14 for Puebla (Table 8).

**Table 8.**

*Degree measures COVID-19 confirmed cases and occupancy reduction*

	Degree
Aguascalientes	0.009345794
Baja California	0.046728972
Baja California Sur	0.037383176
Campeche	0.009345794
Coahuila	0.009345794
Colima	0.018691588
Chiapas	0.056074765
Chihuahua	0.037383176
CdMx	0.009345794
Durango	0.009345794
Guanajuato	0.056074765
Guerrero	0.028037382
Hidalgo	0.046728972
Jalisco	0.046728972
Mexico	0.037383176
Michoacan	0.009345794
Morelos	0.028037382
Nayarit	0.009345794
Nuevo León	0.037383176
Oaxaca	0.037383176
<b>Puebla</b>	<b>0.140186921</b>
Queretaro	0.028037382
Quintana Roo	0.056074765
San Luis Potosi	0.009345794
Sinaloa	0.065420561
Tabasco	0.00945794
Tlaxcala	0.009345794
Veracruz	0.028037382
Yucatán	0.046728972
Zacatecas	0.028037382
.9 on may 2020	0.037383176
1 to 5.9 on may 2020	0.028037382
6 to 10.9 on may 2020	0.018691588
11 to 16 on may 2020	0.009345794
	0
9 on april 2020	0.196261689
<b>1 to 5.9 on april 2020</b>	<b>0.233644858</b>
6 to 10.9 on april 2020	0.130841121
11 to 15.9 on april 2020	0.037383176
16 to 20.9 on april 2020	0.009345794
<b>Low confirmed cases</b>	<b>0.392523378</b>
<b>Moderate confirmed cases</b>	<b>0.429906547</b>
Scarse confirmed cases	0.102803737
Maximum confirmed cases	0.046728972

Personal elaboration using Ucinet (Borgatti et al., 2002).

If it follows from this example to give continuity to complexity approach for tourism, in further research we recommend to develop models that integrate more indicators that allow quantify correlations degree between variables. By now, our power law occupancy distribution networks model contributes finding and representing generic properties of tourism occupancy dynamic as pertinent alternative to understand tourism from transdisciplinary perspective.

### Implications

From this research, academics can model other tourist networks as we have confirmed some essential characteristics of tourism dynamic can be projected.

## Conclusions

This is an attempt to confirm network science pertinence to analyse tourism dynamics, useful to provide quantitative characterization for our understanding of tourism organization principles and some underlying patterns behind this activity.

Our research contributes:

- With verifiable application of network science to tourism analysis.
- Representing tourism dynamic in terms of centrality measures.
- Expressing mathematical formalism behind tourism organizing principles.
- Identifying generic properties of tourism occupancy distribution.
- Modeling tourism and pandemic indicator in tourist destinations.
- Approaching tourism as complex system with interacting elements and susceptible to external perturbations.
- As example of future tourism data analytics using network science.
- With detailed descriptions of tourism complex Dynamic.
- Modeling tourist occupancy in Mexico under normal consumption conditions.
- Modeling tourist occupancy in Mexico affected by COVID-19.
- Identifying destinations that concentrate bulk of tourism and maximum occupancy rates registered, useful to consider when focusing marketing intelligence initiatives and public-private partnerships.
- Identify Mexican states with more tourist destinations, useful to propose focalized tourism restart after COVID-19.
- As alternative to correlate indicators that capture tourism dynamic complexity.
- Confirming Mexican tourism destinations occupancy have same trend regardless month/year.

Perhaps our findings don't have capacity to influence tourism decision makers, still our metrics results add value to project some characteristics of tourism dynamic, and are congruent with reality having strong correlation between confirmed cases and employment rate in densely populated areas; confirming correlation between confirmed cases and reduction in tourism.

This paper shows network science pertinence in tourism; and usage of transdisciplinary tools.

## Discussion on the limitations of the study

Scope in terms of considered indicators remains limited yet, in tourism network analysis real demanding phase is to access and then gather representative elements of the tourism complexity, and foresee connections between those elements; being careful on the data classification; unveil constantly changing and evolving dynamics over seasons and destinations; such as the possible lack of generalization of the results in this research case to other countries or contexts linked to other sociodemographic characteristics. It is also important to have in consideration several different patterns that might arise from the network analysis given tourism inherent complexity according to market segments and tourist offer; in that way depending on the type and intention of the network designed making sense out of the relational data analyzed for enhanced predictability of tourist indicators as well as their practical significance and visualization as a complex system.

## Future directions for research

In future works we can do similar analysis in other countries for degree distribution and organization principles comparison purposes; to be able to make generalizations. And to consider the analysis of other variables like marketing strategies, consumer segments, tourist preferences, currency flows, flights availability, classification of natural, cultural tourist attractions, destinations internet access, sustainability indicators, demographic impacts derived from tourism activity and also perturbations or elements that affect and limit tourist activity like insecurity, emitted warnings for certain destinations, visa restrictions, adverse political environment or considerable cultural differences between visitors and host communities. Still network science to analyse tourism susceptible to external perturbations like COVID-19 in this paper; is pertinent to reveal some tourism dynamic basic properties, providing evidence to develop understanding of tourism complexity.

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## Modelo sistémico de kanban del área de acabados en la industria metal-mecánica

### Systemic kanban model of the finishing area in the metal-mechanical industry

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#### Resumen

El trabajo de investigación tiene la finalidad de modelar un sistema que controle el flujo de materiales utilizando la herramienta de mejora continua (Kanban), al mismo tiempo sirva como un indicador de calidad que especifica la calidad de las piezas procesadas del área de acabados en la industria de Metal- Mecánica TEXNOTEJ S.A de C.V., evitando acumulación de inventarios temporales de producción, permitiendo agilizar las tareas adecuadas y mejorando la gestión eficiente del trabajo. Los datos obtenidos pertenecen a la empresa TEXNOTEJ S.A de C.V. en el que se consideran 12 trabajadores por turno, el departamento a mejorar es el área de terminado a través de un Diseño de una red de modelado sistémico basada en (Kanban) la cual se programa con el software Arena 6ta Edición, que permite asignar adecuadamente la multitarea, así como

#### Abstract

The purpose of the research work is to model a system that controls the flow of materials using the continuous improvement tool (kanban), at the same time serving as a quality indicator that specifies the quality of the processed parts of the finishing area in the Metal-Mechanical industry TEXNOTEJ S.A de C.V., avoiding the accumulation of temporary production inventories, allowing appropriate tasks to be expedited and improving efficient work management. The data obtained belongs to the company TEXNOTEJ S.A de C.V. in which 12 workers per shift are considered, the department to be improved is the area completed through a Design of a systemic modelling network based on (kanban) which is programmed with the Arena 6th Edition software, which allows appropriately

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incrementar las capacidades eliminando los cuellos de botella.

**Palabras clave:** Lean manufacturing, Kanban, flujo de materiales, modelado sistémico, control de producción.

## Introducción

Actualmente en este mundo altamente globalizado las empresas o instituciones que tienen la necesidad de mantenerse activas en el mercado, necesitan cumplir con las exigencias de calidad, entrega y cantidad de productos y/o servicios sin generar demoras en la fabricación. Una de la filosofías que propone mayores beneficios con el mínimo de los recursos es lean manufacturing, dando origen a una nueva etapa de producción (Tejeda, 2011). Una de las herramientas a aplicar dentro de las áreas de logística y cadenas de suministro en el Kanban, dicha tarjeta viajera es un instrumento de control y representa un factor importante para incrementar la eficiencia y rentabilidad optima en la distribución de los recursos (Herrera et al., 2016).

Por ello la importancia de implementar de manera más eficiente los sistemas de producción complejos en plantas de fabricación, aumentar la productividad permite mejorar las condiciones de maquinado y producción de cada una de las etapas o tareas por realizar de una manera programada. Automatizando la información y procesamientos de los datos, generando una gestión administrativa más eficiente con la programación de los procesos industriales (Mejillones Mamani, 2020). Es una necesidad constante de la Industria 4.0. La evolución de procesamiento de datos para generar estándares (Roza, 2020). A partir de herramientas de calidad como la tarjeta viajera. Debido al cambio constante en las condiciones de fabricación los sistemas de manufactura actuales se apoyan de las nuevas herramientas tecnológicas, sensores y software especializado para tener un control de la manufactura en tiempo real (Lasi et al., 2014).

Existen varias metodologías japonesas de mejora continua enfocadas a mejorar los procesos industriales, la creciente necesidad de tener un control más eficiente de los recursos da rumbo a la implementación de filosofías como la tarjeta Kanban que es una herramienta de manufactura esbelta, encargada de asegurar la producción que el cliente solicita en tiempo y forma (Torralba Martínez et al., 2007) (Shingo, 1985).

assigning multitasking, as well as increasing capabilities by eliminating bottlenecks.

**Keywords:** Lean manufacturing, kanban, material flow, systemic modeling, production control.

Actualmente las empresas tienen la necesidad de establecer metodologías que les permitan mantener su posición en el Mercado. Además, necesitan un buen sistema de gestión que cumpla con las exigencias de los clientes y aumente su valor agregado (Carballo-Mendivil et al., 2018). La filosofía de manufactura esbelta hace mejoras al proceso industrial eliminando desperdicios y optimizando las tareas de trabajo (Oleghe Omogbai & Salonitis, 2016). Es importante implementar la metodología de kanban a través de estrategias sólidas que de forma clara permitan mejorar el proceso productivo aumentando la eficiencia y eficacia mediante una forma organizativa (Drohomeretski et al., 2013).

La filosofía de manufactura esbelta se implementó desde los años cincuenta y sirve de base a la gestión de la calidad y en la coordinación de sus herramientas técnicas (Cirjaliu Bianca & Draghici, 2016). Es fundamental poder resaltar e identificar los elementos esenciales como: operaciones, flujo de materiales, tiempo y logística para poder estandarizar el proceso (León et al., 2017).

Se puede decir que son muchas las herramientas que conforman esta filosofía sin embargo se hace mención únicamente a las principales que pueden ser: Visual Management (Arbós, 2009) (Marinelli et al., 2021). Total Mantenimiento Productivo (TPM) (Álvarez Coello & Segovia Albarracín, 2024). Six sigma (Taghizadegan, 2006) (Ellis, 2020). Poka yoke (Barash, 1990), entre otros.

Existen varias metodologías japonesas de mejora continua enfocadas a mejorar los procesos industriales, la creciente necesidad de tener un control más eficiente de los recursos da pauta a la implementación de filosofías como la tarjeta Kanban que pertenece a la filosofía de lean manufacturing propuesta por Toyoda y Ohnopioneros japoneses en implementar dicho concepto (Padilla, 2010). Encargada de eliminar los desperdicios dentro de la producción, asegurando la calidad de los productos que el cliente solicita en tiempo y forma (Torralba Martínez et al., 2004) (Shingo, 1985).

Actualmente las empresas tienen la necesidad de establecer metodologías que permitan mantener su posicionamiento en el Mercado, la filosofía de lean manufacturing realiza mejoras al proceso industrial eliminando desperdicios y optimizando las tareas de trabajo (Oleghe Omogbai & Salonitis, 2016). Es importante implementar dicha metodología a través de estrategias solidadas y de manera clara y organizacional (Drohomeretski et al., 2013).

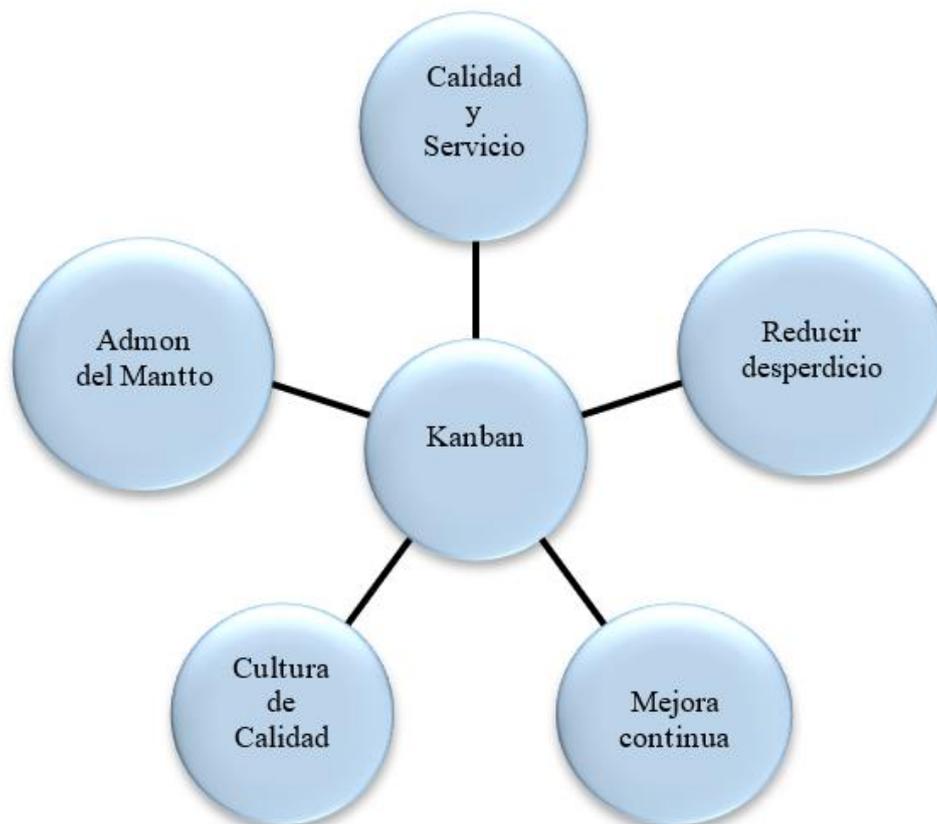
### Kanban

Diversos autores presentan diversas definiciones de la metodología Kanban, en la presente investigación se considera. La herramienta Kanban como un Sistema que produce la

cantidad necesaria evitando excedentes innecesarios que el mimo evita sobrecargar al equipo de trabajo buscando la producción JIT Justo a tiempo (Gaete et al., 2021).

La definición de Kanban proviene de las palabras japonesas "Kan" y "Ban", que significan tarjetas o tableros visuales. Con esta herramienta se puede realizar una inspección de tipo visual, que puede identificar y mejorar los procesos de fabricación para optimizar sus productos (Visbal Pérez & Thamara, 2013).

En la **Figura 1**. Se muestran los principios utilizados por la metodología kanban (Mitra & Mitrani, 1991).



**Figura 1.** Principios Kanban.

Fuente: Elaboración propia (2021).

El primer principio menciona la Calidad perfecta a la primera: todo lo que debe hacerse bien desde el principio con calidad. No hagas las cosas rápido y con errores, ya que es mucho más caro reprocesar los productos que fabricarlos bien desde el principio.

El segundo principio es la Minimización de residuos: Tiene como objetivo hacer solo lo necesario sin realizar actividades o tareas

adicionales a la producción real del producto (principio YAGNI).

El tercer principio de Mejora Continua: permite mejorar las actividades industriales en la fabricación de productos de acuerdo a cada objetivo previamente planteado para lograr y alcanzar las metas planeadas por la organización.

El siguiente principio es la Flexibilidad: esta está referenciada hacia las tareas a realizar en función

de faltantes o componentes que deban priorizarse según el grado de prioridad que tengan en cuanto a la entrega de las piezas entregadas en tiempo y forma.

Finalmente, el último principio se centró en la Construcción y el mantenimiento: se deben mantener buenas relaciones junto con los proveedores manteniendo una relación con la cadena cliente-proveedor que permita una comunicación efectiva entre el binomio Cliente-Proveedor.

Una tarjeta Kanban permite realizar una determinada tarea paso a paso que describe detalladamente la asignación de la tarea, el responsable de su ejecución, el tiempo estimado para su realización, la identificación de la pieza de cada una de las tarjetas. Es bien conocido el sistema pull, como una tarjeta de viaje de pedidos de clientes en la que el flujo se realiza en sentido inverso pasando por cada puesto de trabajo (Spearman et al., 1990). Esta propuesta trata de eliminar la sobreproducción y que su flujo de materiales sea más fluido, también la aplicación de un sistema kanban con flujo de materiales, donde se puede hacer una separación de los procesos de fabricación y estas tarjetas visualiza el flujo de proceso industrial desde su diseño, desarrollo y validación (Swee et al., 2012). Cada tarjeta kanban representa una alerta al sistema, los cuales se unen para tener un control estable y flexible de las tareas u operaciones del ciclo de vida del producto (Castellano Lendínez, 2019). Recuerde que la metodología implica adoptar un nuevo cambio de cultura de calidad dentro de una empresa por parte de los trabajadores, queriendo incorporar a su estilo de vida laboral sostenido mejorando sus acciones, técnicas e incorporando cada vez más sus herramientas lean en la industria aumentando la productividad y eficiencia de los trabajadores.

Por otro lado, la tarjeta kanban permite comprender el proceso de trazabilidad y el flujo de trabajo documental que se genera para poder realizar un control de procesos asegurando las buenas prácticas y una gestión de la calidad adecuada, fomentando el trabajo en equipo en base a las métricas de la herramienta, que brinda los argumentos necesarios para la toma de decisiones con base en sus efectos (problema) y sus causas que originan dicho problema (Dante Carrizo & Alfaro, 2018).

Hay varias formas de aplicar los sistemas Kanban dentro de las empresas. Para esta investigación en particular, la definición presentada por Acevedo et al. se utiliza en el que menciona que Kanban es una técnica que se basa en un sistema pull el cual elimina la programación centralizada, se realiza lo demandado por los clientes, solo se rotan los materiales necesarios que garanticen la continuidad de los consumidores de la empresa o institución, si no hay demanda del producto, las actividades o tareas que forman parte de la planificación de los productos se paralizan temporalmente, lo que hace que el Sistema de producción se convierta Justo a Tiempo (Quintero Torres et al., 2019).

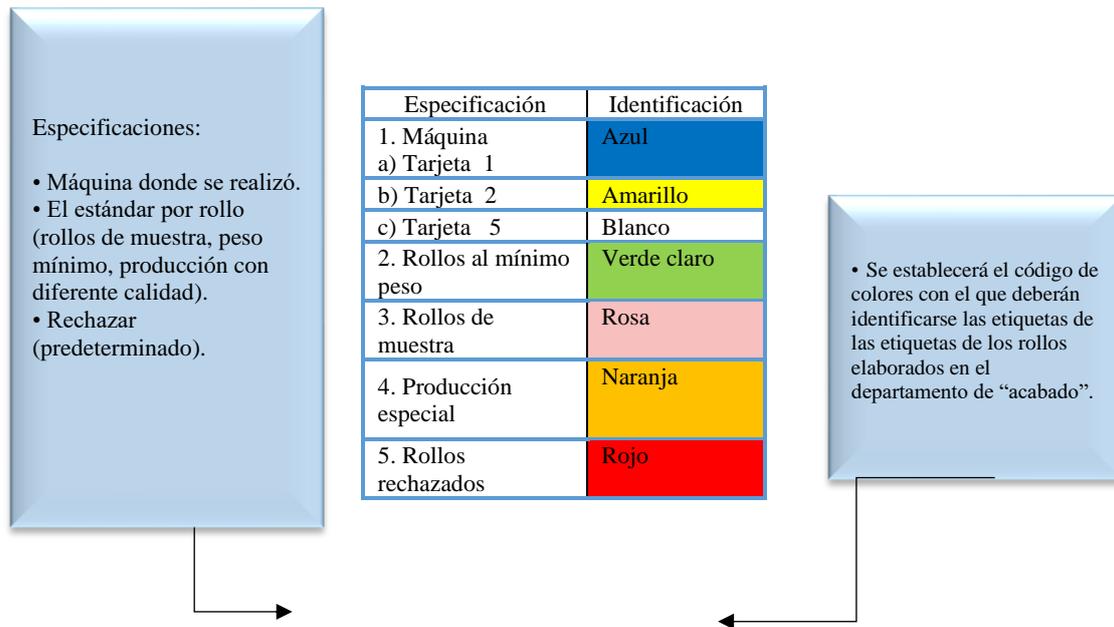
### Metodología Kanban

Se puede aplicar a cualquier sector, ya sea de servicios o industrial, donde la distribución de la materia prima tenga un flujo constante y rutas bien establecidas donde se apliquen de manera controlada las técnicas que permitan asegurar una gestión del control de la producción, en esta investigación se desarrolla el método de la tarjeta viajera o kanban que se ajusta al proceso de fabricación, es decir, es un estudio empírico que muestra la mejora del flujo de materiales en base a un sistema de agente de simulación computacional que permite la asignación adecuada de la distribución de tareas y procesos, conocer de antemano el comportamiento del sistema, tiempos de distribución, cuellos de botella, reprocesos, etc. presentados en la empresa TEXNOTEJ S.A de C.V. es posible generar indicadores para poder medir y tener un control riguroso de los movimientos de materias primas, esto es posible, a través de la integración de eventos que permitan anticipar el comportamiento de sus procesos.

Usando los siguientes pasos:

1. Se realiza un recorrido en planta el cual nos permite conocer el estado actual del proceso para poder realizar las propuestas necesarias, con el apoyo del departamento de aseguramiento de calidad se verifica el código de colores de cada unidad producida y/o maquinaria, así como las tarjetas de viaje kanban utilizadas durante el proceso Ver.

### Figura 2.



**Figura 2.** Tarjeta Kanban de No Conformidad.

2. Definir el flujo de trabajo es prioritario ya que la capacitación permite dar a conocer desde la alta dirección hasta los mandos medios el nuevo código de colores que utilizará en sus procesos industriales, es importante mencionar que uno de los requisitos de auditoría del sistema de gestión de calidad es la codificación de sus formatos declarados en su sistema, cualquier cambio en sus documentos de manera inmediata debe modificarse y aprobarse para que se manejen dentro de la empresa, lo más importante en cualquier organización en el manejo de documentos, ya que no puede haber documentos no controlados, por cuestiones de auditoría interna no es posible mantener e implementar instrumentos o listas de chequeo que no pertenezca al sistema.
3. Capacitación al personal operativo sobre el uso y manejo de las tarjetas de viaje Kanban, es de suma importancia saber cuál es el flujo correcto de materiales, es decir, entender la forma correcta en que se distribuye la materia prima es un factor importante para asegurar la producción en tiempo y forma, las operaciones de cada trabajador se pueden planificar de acuerdo a las necesidades reales de la distribución del material, es importante informar al personal de las tareas de producción previstas maximizando su eficiencia. En la **figura 3** se muestra la capacitación y comunicación efectiva que se ofrece al personal de entrenamiento de la empresa.



**Figura 3.** Formación del Staff Operativo de la zona de llegada.

4. En función del Stop Inicio, Inicio Finalización de la producción en la que se encuentre a su vez. Los colegas del departamento de acabado deben evaluar al personal operativo con la siguiente decisión: "Defecto Kanban no permitido" o "Kanban aprobado", según corresponda, en el

departamento de acabado. En **Figura 4.** Se observa que, una vez aprobado el producto, será llevado al departamento de acabados en el lugar de almacenamiento asignado para su acabado, en caso de no ser aprobado por el departamento de calidad, se deberá llenar la tarjeta "Rechazo Kanban".



**Figura 4.** Rollo de tela aprobado Usando Kanban aprobado.

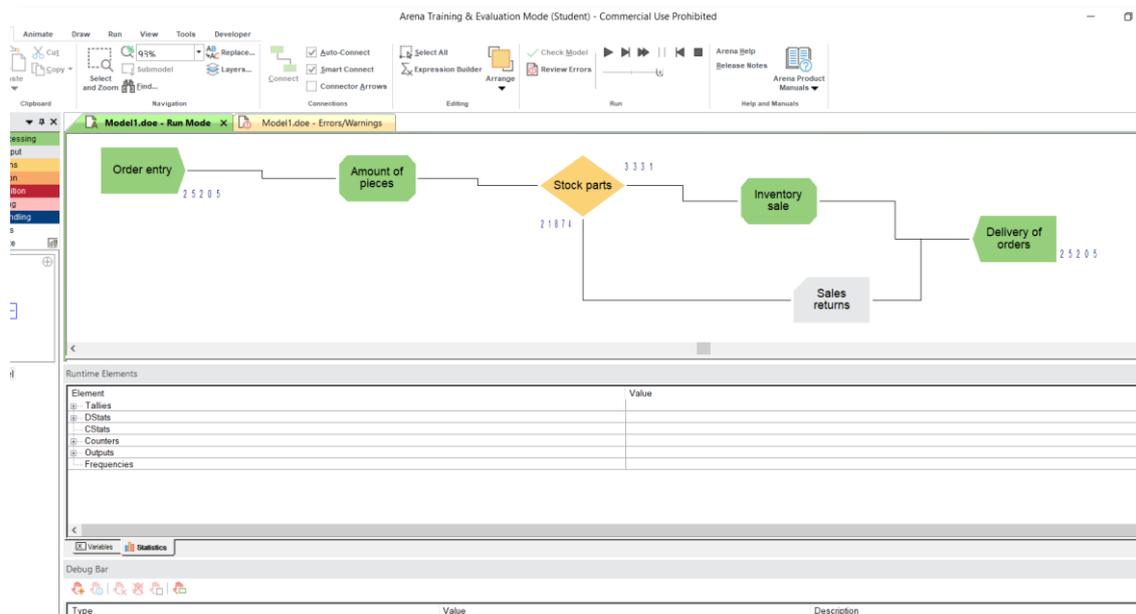
5. La evaluación y seguimiento se realiza a través de un estado actual del sistema que es monitoreado por el software Arena donde se plantea el flujo de materiales y la medición de tiempos.
6. Mediante el uso del modelado de un sistema evolutivo se puede conocer el flujo de materiales, la correcta distribución se puede analizar el estado actual y el estado de mejora continua.

### Simulación

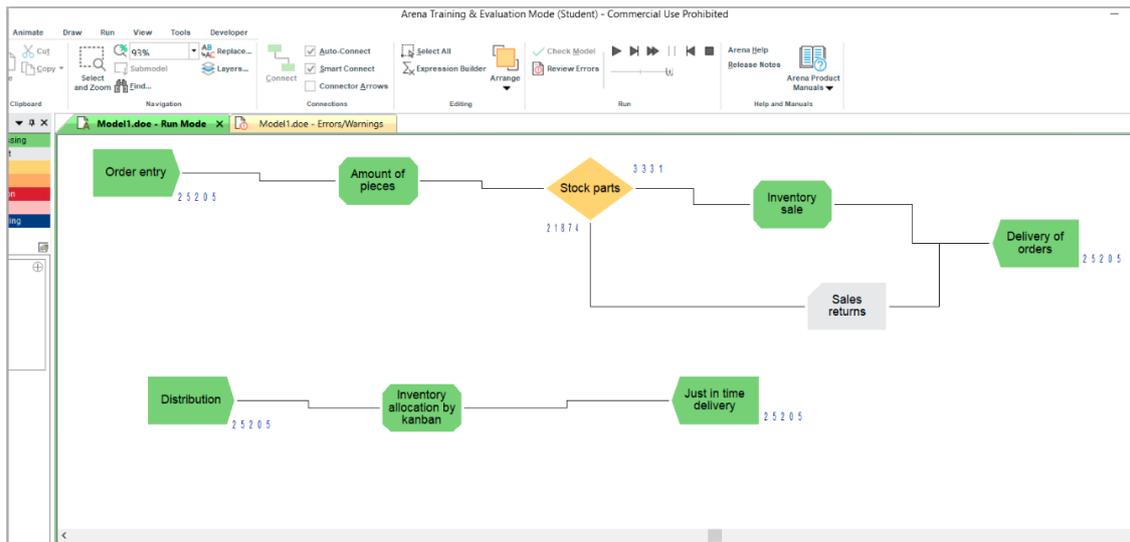
Se modela utilizando el Software arena versión 2020 en el cual se integraron dos modelos, el primero muestra el estado actual y la forma de distribución de los rollos, también la nueva forma a través del método kanban. En el primer modelo (estado anterior) del departamento de acabados se muestra en la **Figura 5**. Aquel en el que se observa la forma de operar de manera actual dentro del departamento de acabados desde el ingreso de los pedidos a la empresa por parte del cliente, la especificación técnica de la cantidad

de piezas, la disponibilidad del inventario para la entrega de los productos y el cumplimiento en la venta considerando también las devoluciones y entregas del producto, sin considerar el tiempo en las entregas de los productos, lo que se pretende dentro de la empresa es realizar las entregas de los productos terminados en tiempo y forma ya que las relaciones con los clientes mejoraría al tener la posibilidad de entregar los pedidos a tiempo.

En la **Figura 6**. El modelo de mejora propuesto (estado actual) se muestra con la metodología Kanban considerando tres variables adicionales al modelo que pueden influir en la mejora del sistema y distribución de los productos las cuales son: Distribución, Asignación de Inventario por tarjeta Kanban y Justo tiempo de entrega en la entrega de productos, mejora los índices de producción y corrige deficiencias en las entregas de los productos al cliente potencial, mejora las relaciones laborales y optimiza la productividad de la empresa.



**Figura 5.** Análisis del estado previo de la zona de acabado.



**Figura 6.** Análisis del estado actual de la zona de acabado

## Resultados y Discusión

Esta investigación aplicada tiene como propósito principal implementar una de las herramientas de la filosofía Lean Manufacturing, Kanban específicamente en su área de acabados de TEX NO TEJ S.A de C.V.

En base al objetivo planteado, se considera como población total las ventas totales del año 2021, con el fin de mejorar los métodos anteriores de la empresa con el estado actual que tiene como objetivo obtener una mejora en sus procesos de manufactura, aumentando la productividad de los trabajadores y eficiencia de la empresa principalmente de los departamentos de crudo y acabado. En la **Figura 7**. Los datos obtenidos por arena fueron recolectados a través del reporte de los datos y estos son modelados a través del IBM SPSS Statistics programa versión 27, el cual nos muestra en comparaciones del estado anterior contra el estado actual, en el cual se puede observar que la probabilidad de los datos se

ajusta mejor a la media a diferencia del estado anterior que no hay ajuste en el proceso el cual puede ser interpretado que anteriormente la empresa no seguía un estándar, es decir un indicador que permita medir las entrega de productos al cliente, había sesgo en los datos por lo que no se ajustaba al promedio del proceso, esto es importante ya que mi entrada puede entregar más productos en tiempo y forma es decir, se ajustan al estado actual mejorar la situación de las licitaciones o ventas de la empresa, estabilizando el comportamiento de las órdenes de producción lo que permite mejorar las variables que se mencionaron en esta investigación que son: Distribución, Asignación de Inventario por tarjeta Kanban y en entrega de productos, en el gráfico también se puede interpretar que esta mejora estabiliza el estado actual de producción, generando una menor probabilidad de error que el estado anterior, siempre y cuando se implemente el kanban se continúa con la tarjeta.

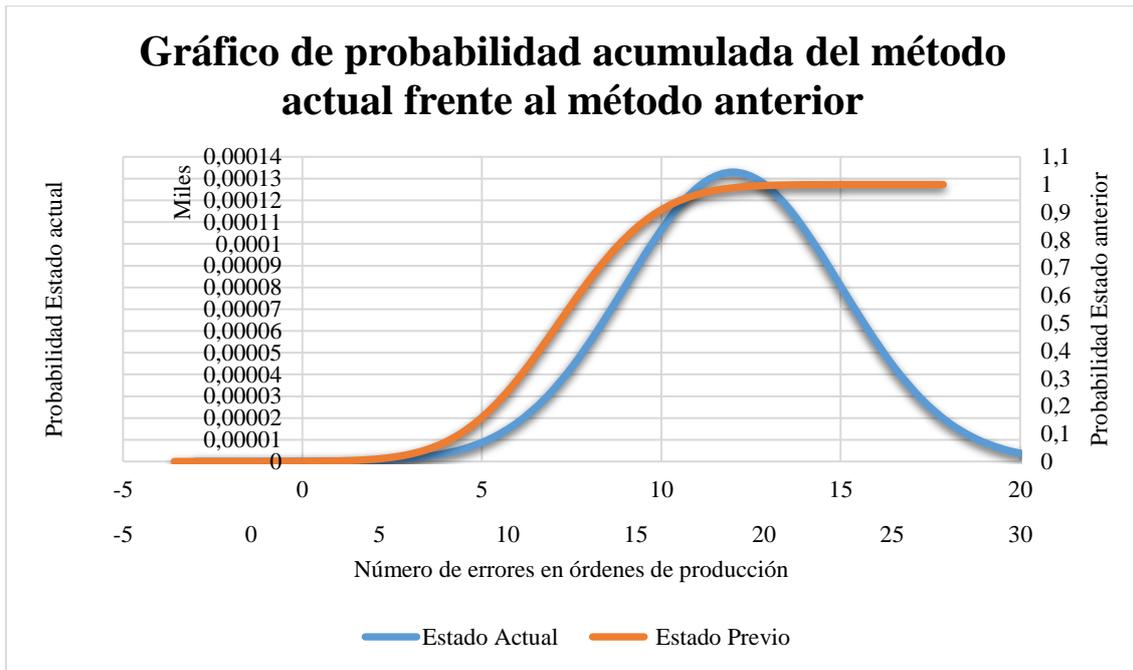


Figura 7. Modelo de simulación de estado actual frente a estado anterior.

Finalmente, se realiza una evaluación ante la alta dirección con el apoyo del departamento de aseguramiento de calidad y se monitorea el

modelo implementado en el área de acabados, con el fin de dar un buen control sobre el flujo de materiales.

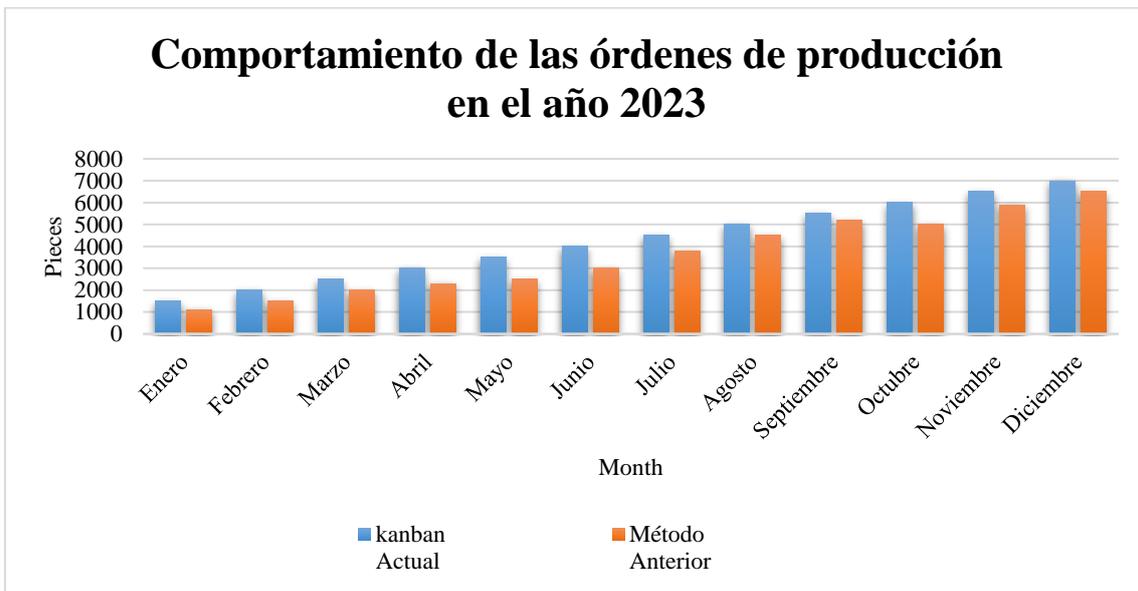


Figura 8. Modelo de simulación para mejorar el proceso productivo del área de acabado.

En la **Figura 8**. Se muestra el comportamiento del estado actual, que permite cubrir con mayor rapidez las órdenes de producción en grandes lotes de piezas al ser enviadas rápidamente a los siguientes procesos, reduciendo tiempos y priorizando las actividades de los trabajadores, maximizando los recursos y optimizando los recursos de la empresa, con la finalidad de mejorar la prioridad de los pedidos de cada mes a través de un sistema de control Kanban.

### Conclusiones

En la realización de este proyecto se evaluaron las ventajas y desventajas, así como las limitaciones y factores importantes para implementar la estrategia Lean Manufacturing, en particular la técnica "Kanban". Esta implementación tiene como objetivo supervisar la distribución adecuada de materiales y promover una cultura de producción en el área de

acabados. Además, busca reducir los niveles de inventario y garantizar un flujo eficiente de materiales entre departamentos.

El uso de tarjetas "Kanban" ayudó a identificar deficiencias en el flujo de materiales, como pérdida de tiempo o desperdicio según la filosofía Lean Manufacturing. También se observó el compromiso del personal operativo para utilizar correctamente estas tarjetas en cada departamento.

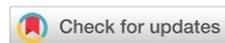
El análisis de la modelación sistémica de esta investigación busca tener un correcto control sobre la distribución de los materiales del departamento de acabados, a la vez permite establecer indicadores de productividad, aumentando el compromiso de las personas operativas del área de acabados, con el manejo adecuado de la tarjeta kanban e impactando significativamente en la mejorar las condiciones de la planta.

Se recomienda a la empresa dar continuidad al uso de esta herramienta creada para mejorar el seguimiento del flujo de materiales, lo que eventualmente redundará en una mejora de la calidad y la prevención de retrasos en las entregas. Además, es crucial que la alta dirección se comprometa y tome conciencia de la importancia de este proceso, ya que, debido a dificultades previas, la empresa se ha visto obligada a vender su producto con especificaciones distintas a las requeridas por el cliente, lo que ha afectado la coherencia en los códigos de colores. Se ha implementado el uso de tarjetas Kanban en los demás departamentos como parte de esta iniciativa.

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## The legacy of Nizami Ganjavi in Transoxiana: An analysis of Khamsa's influence on oral narrative

### Nizomiy Ganjaviyning Mavoronahr merosi: Xamsa'ning og'zaki hikoyatga ta'siri tahlili

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#### Abstract

Nizami Ganjavi, one of the distinguished poets of the 12th century, has a special place in world literature with his works from ancient times to the present. This poet is famous not only in Persian literature but also in Turkish and Indian literature. Nizami Ganjavi is related to the Mesnevi works, which were translated into Turkish and even translated by many Turkish poets and writers in the following centuries. Among these, we can count the essential figures of Chagatai Turkish literature (Transoxiana), especially Emir Alişer Nevai, who cared about Mesnevi Khamsa Nizami and made changes and wrote examples based on his stories. Nizâmî, with the dreams and images created in the Mesnevi above, has revealed an original style that is very important in today's comparative literature field at the international level. He proved his success by creating a new style of fantasy drawing using imaginary images, and many poets influenced by him entered the field of literature. This article refers to Panj Ganj or Khamsa Nizami Ganjavi's works and tries to explore his influence on Transoxiana writers. The study uses a qualitative, library, and comparative methodology and is founded on the laws and categories of scientific research. Researchers applied modern research approaches and methods (general scientific analysis, comparison, generalization, systematization, text analysis, and retrospective analysis).

**Keywords:** Nizami Ganjavi, Khamsa, Persian literature, Transoxiana, Alisher Navoiy.

#### Annotatsiya

XII asrning atoqli shoirlaridan biri Nizomiy Ganjaviy qadimdan bugungi kungacha yaratgan asarlari bilan jahon adabiyotida alohida o'rin tutadi. Bu shoir nafaqat fors adabiyotida, balki turk va hind adabiyotida ham mashhur. Nizomiy keyingi asrlarda va hatto ko'plab turk shoir va yozuvchilari tomonidan turk tiliga tarjima qilingan mesneviya asarlari bilan bog'liq. Bular orasida Chig'atoy turkiy adabiyotining (Mavoronahr) muhim namoyandalari, xususan, Xamsa Nizomiyni qo'llab-quvvatlagan, hikoyalarida o'zgartirishlar kiritgan, namunalar yozgan amir Alisher Nevaiyni sanashimiz mumkin. Nizomiy Mesneviyda yaratgan orzu va obrazlari bilan bugungi qiyosiy adabiyot sohasida xalqaro miqyosda juda muhim bo'lgan o'ziga xos uslubni ochib berdi. U xayoliy obrazlar yordamida yangi muvaffaqiyatli fantaziya uslubini yaratdi va undan ta'sirlangan ko'plab shoirlar adabiyot maydoniga kirib keldi. Bu maqola Panj Ganj yoki Xamsa Nizomiy asarlariga ishora qilib, uning Transoxiana adiblariga ta'sirini o'rganishga harakat qiladi. Tadqiqotda sifat, kutubxona va qiyosiy metodologiyadan foydalaniladi va ilmiy tadqiqot qonunlari, toifalariga asoslanadi. Tadqiqotchilar zamonaviy tadqiqot yondashuvlari va usullaridan (umumiy ilmiy tahlil, taqqoslash, umumlashtirish, tizimlashtirish, matn tahlili va retrospektiv tahlil) foydalanganlar.

**Kalit so'zlar:** Nizomiy Ganjaviy, Xamsa Nizomiy, Fors adabiyoti, Mavoronahr, Ali Shir Nevoiy.

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## Introduction

Knowledge and literary sciences popularized among the Turks of Central and Trans-Asia began with their conversion to Islam. The first written literary science among the ancient Turks, the work created by combining selected poems, is called Divan. On the other hand, names such as old Turkish literature, classical Turkish literature, and Islamic Turkish literature are also used in the history of literature. Since most of the literary period is focused and studied in three areas of Turkish literature, it can be acknowledged that the literature related to the Turkish area, whether in Central Asia or Transoxiana, was studied in the category of Turkish classical literature.

It is necessary to explain that classical Turkish literature is divided into three fields: Chagatai, Azerbaijani, and Anatolian. From the 16th century onwards, Anatolian Turkish literature was known as Ottoman literature. However, the dimensions and extent of Persian literature's influence on Turkish literature were more evident in the 15th century AD till today. (Golkarian, 2020)

The impact of Persian literature on the cultural and literary structure of the Transoxiana region is a subject that requires expanding the scope of research. Although research has been done in this field, and the impact of classical Persian literature on the cultural and literary environments of ancient and modern Uzbek literature has been examined through academic research, it is not enough. Persian literature has had a profound cultural and literary impact on the Transoxiana region, especially Uzbek writers and poets, since the 15th century. It is possible to see the continuation of these traces of influence, even in Anatolian Turkish literature, in the following centuries (16-19 centuries). In this context, Evidence dating from the 18th to the 20th centuries shows that Persian literature played an essential role in changing the region's intellectual and cultural geography and establishing modern Persian literature. After Alisher Navoyi and his contemporary poets, writers such as Mirza Siraj Hakim, Sadr al-Din Aini, and Abdul Raouf Fitrat created different and innovative works under the influence of these environments.

In general, current research on Uzbek Turkish as a result of field research proves this. Nizami Ganjavi, an Azerbaijani Turkish poet, wrote all his works in Persian, and among them, his work "Khamsa" became a point of inspiration for many

poets and writers. Even if research has been done on Persian and Uzbek literature, Nizami Ganjavi's influence and fact-creation on literary figures in the Transoxiana region are not included. For this reason, the present research fills a significant gap in scientific and literary history.

Therefore, among Turkish literature researchers, the beginning of the profound influence of Persian literature on Turkish literature can be considered from the Ottoman Empire. Despite the attention to the purification of the Turkish language in literature and the tendency to simplify and use Turkish words, Turkish literature became popular among ancient writers, including Alisher Navoiy in the Transoxiana region and Ahmed Pasha and Nejati in Anatolia. In the history of Turkish literature, this period is known as "the course of orientation to simple Turkish" or simple writing in the language. But breaking away from Persian literature was impossible. (Aydın, 2022)

## Theoretical Framework or Review of Literature

As a historical region in Central Asia, Transoxiana has matured and developed religiously and literarily with Persian literature. This region includes parts of today's Turkmenistan, Uzbekistan, and Kazakhstan. The area is culturally enriched entirely with Persian resources. Therefore, the role of Turkish and Muslim poets and literary figures is essential for field research. Nizami Ganjavi's poems as stylistics are essential, and are known as the owner of the style and the leader of storytelling in literature. The influence of his poetry on the poets of Central Asia, Turkish literature, and even the poets of the Indian subcontinent is apparent. Since the beginning of the 7th century, following Nizami, khamsa writing has been started, and one of the ancestors of Uzbek poets who was inspired by Nizami's Khamsa and wrote Khamsa is Alisher Navoiy. Naming such personalities and their works mentioned in the other section of this research can be the basis for continuing their field research. In addition to Uzbek poets, other poets have been inspired by Nizami Ganjavi and continued his style. Amir Khosro Dehlavi, Khajui Kermani, Abdul Rahman Jami, Katabi Torshizi, Vahshi Bafghi, and Faizi Dakkani have composed romantic verses similar to Khamsa Nizami. Examining the available scholarly sources on Nizami's works is important when reviewing the literature. Some of

the results of the literature review are as follows: The thesis titled "Transoxiana (its place and importance in Turkish-Islamic history)" is the research topic, which was conducted by taking into account sources such as the historical, economic, cultural, and social structure of Transoxiana, works, etc. It is envisaged to be done. This study examines the role of Transoxiana in the Turkish-Islamic world and the influence of Nizami's works in this region. Therefore, Ali Avcu's Work on Islamism is known. By comparing our article, the subject has been discussed from different dimensions. In addition, based on the Transoxiana Encyclopedia, the region has experienced significant historical developments and is also essential in economic, cultural, and social structure. Persian Literature and Persian sources played a crucial role in all these developments. It helps explain the theoretical foundations, creating a theoretical framework for these sources. It will especially enable one to obtain more information about Nizami's works and the general situation of Transoxiana. It is also influential in the development of Uzbek literary history.

### Research Methodology

The research method in this article is field and library studies. What is considered as research findings are presented in descriptive and analytical form. In this research, the influence of Khamsa Nizami on the poets of Turkish classical literature, especially the Transoxiana poets, has been carefully considered, and the existing examples have been studied in terms of influence inspired by the style of comparative literature. In line with the research method, references and articles have been analyzed. In this research, library and qualitative methodological approaches have been considered. Also, to understand the issues, comparative methods have not been neglected in explaining the poets' views of the past centuries in the Transoxiana region from their works. In this regard, the studies of published sources in books, articles, and documents in the state museums of Uzbekistan, Azerbaijan, and Iran have been considered. Also, data analysis is considered based on the documents available in the study sources. Of course, there are limitations in the field of access to some handwritten sources related to the past centuries, and the use of such sources from the pages available in the Internet data has been considered.

### Results and Discussion

Khamsa, written by Nizami Ganjavi, is unique in stylistics, definition, and description of anecdotes. The use of metaphorical language and characterization in 5 different volumes in the Khamsa collection proves the ability of this great poet of the past centuries. He used this in his poems in 5 separate volumes, which are named Makhzan al-Asrar, Seven Figure, Lili and Majnoon, Khosrow and Shirin, and Iskandernameh; in addition to talking about mediated and unmediated forms; he also mentions the distinct and valuable moral qualities of human beings. His messages often involve fighting injustice, raising love and loyalty, and prioritizing the human concept. This attitude and approach is specific and unique to Nizami Ganjavi, which other Turkish and Uzbek poets have also been inspired by and adapted from the name of Khamsa. Alisher Navoiy is one of the most prominent and famous poets and mystics of the 15th century AD in the Transoxiana region. He has emphasized these moral values and norms in his work, Khamsa. Khamsa Nizami Ganjavi's work is a synthesis of Persian literary achievements. From Ferdowsi's heroic attitude to Khayyam Nishabouri's esteemed belief, Sanai's human-centeredness opinion and Onsoni or Farrokhi's lyrical lyricism have signs in his Khamsa. In one sentence, it can be said that Khamsa Nizami is a collection of Persian literature's philosophical, cultural, literary, and historical attitudes that have fascinated the poets of the Transoxiana region. This fact can be well understood by comparing Ottoman and Turkish Uzbek literature. Therefore, the Khamsa work is taken into consideration as research material.

Nizami Ganjavi is one of the greatest and most prominent poets of the Persian language of Azerbaijan and is considered one of the greatest poets of the Middle East in the Middle centuries. He is the most excellent romantic poet in Persian epic literature, who introduced colloquial speech and realistic style into Persian epic poetry. Therefore, his work can be considered among the works analyzed in literary aesthetics. At the same time, Nizami Ganjavi's literary works include a philosophical view of literature. Primarily, the book "Panj Ganj," later called Khamsa, dramatically contributes to forming Iranian or Eastern mystical and romantic culture, also due to Nizami's critical role in Persian literature storytelling.

In Azerbaijan, they respect Nizami Ganjavi and consider him the founder of their classical

literature. Using the themes of traditional oral folk art and historical written records, Nizami has united Iran's literary periods before and after Islam with his poems. Nizami epic-romantic poetry influenced the Eastern world during the following centuries, and many poets, writers, and playwrights have tried to imitate it. Many later generations, not only in Iran itself but throughout the region, including in the culture of countries such as Azerbaijan, Armenia, Afghanistan, Georgia, India, Iran, Pakistan, Tajikistan, Turkey, Turkmenistan, and Uzbekistan, accepted his literary vision. Teaching the literary works of the past becomes a tool for defending people's identities by using the powerful resources of the national cultural heritage and understanding its remarkable predictive potential. (Pokhilko, Ivanova, & Martynenko, 2020)

His works have influenced great poets such as Hafez Shirazi, Jalaluddin Muhammad Balkhi, known as Rumi, Mullah Muhammad Fuzuli, and Saadi. His long Mathnawis, known as Khamsa,<sup>3</sup> on Iran and Transcaucasia. According to the French historian René Grosse, the Seljuk sultans, who were Turkmen themselves and had become the sultans of Iran, did not leave Iran, but on the contrary, voluntarily became Iranians and, like the Sasanians and other great ancient kings, defended Iran and Iranians against the attacks of other nations and tribes. And they were trying to save Iranian culture from the threats of the Turkmens. (Grousset, 1970)

Persian language and literature are considered a literary language as well as the language of science among Turkish communities. For this reason, it is not possible to separate from it. For example, Alisher Navoiy, in his book *Muhâkemetü'l-Lugateyn*, although he made a linguistic and conceptual comparison between the Turkish and Persian languages, confirms the non-separation between the Persian and Turkish languages with the following verses:

معنی شیرین و رنگینم به ترکی بیحد است  
 فارسی هم لعل و درهای تمین گر بنگری  
 گویا در است بازار سخن بگشاده ام  
 یک طرف دکان قتادی و یک سو زرگری

*"It means that the meaning and concept of the Turkish language are delightful and colorful. But if you pay attention to the Persian language, it is like precious pearls. When I speak in Persian, it*

has many themes in the fields of epistemology, and today, by examining and delving into the many themes of his works, one can see his influential role in the literature of the Eastern world. The characters in his poems, who are mentioned in the Mathnawi of Khosrow and Shirin, Leili and Majnoon, and the Mathnawi of Iskandar-name as the heroes of the story, can be understood in many literary works of Islamic countries and Persian and Turkish literature.

Mullah Mohammad Fuzuli (1494-1556) is one of the greatest poets of Turkish literature and a significant figure in Azerbaijani and Ottoman literature. With the lyrical story "Laili and Majnoon," he has brought the necessary descriptions of his influence to the fore by using mystical metaphors and symbols from poets such as Nizami Ganjavi, Jami and Hafez, and Alisher Navoiy.

At the time of Nizami's birth, a century had passed since the attack of the Seljuk Turks *is as if my mouth is a pearl market. But it must be said that in this market, sweets are offered on one side and gold on the other."*

Or in another place he says in Uzbek:

**Chun fors irdi nukte shougi  
 Azrag' idi onda turkiy zovgi  
 Min turkcha boşlan rivayat  
 Galdim bu fisonani hikoyat  
 Kim shuhrati chun jihongir tolgay  
 Turk iliga tog'i behre bulgay**

*"When the essence of the word was said in Persian, it had little appreciation in Turkish. However, when I heard thousands of Turkish narrations, I had to tell this truth. Anyone who wants to be famous worldwide must be Turkish and find the benefits of this."*

Therefore, the ancient writers could not in any way distance the Persian language from Turkish literature or ignore it. This intellectual development also appeared strongly in the borders of the Ottoman Empire. So, the best works of Persian literature were translated by Turkish-speaking writers and poets and found a special place in classical literature, looking at the "Tazkirat al-Shu'ara" (Memoirs of the Poets) of poets and the collection of poetry books that were written and composed in Turkish literature

other old Iranian sultans, to protect the people and the land of Iran, they fought against the looting of the Oghouzi groups and other aggressors to the borders of Iran. They worked hard to save and develop Iranian culture and literature.

<sup>3</sup> The Seljuqs were originally Turkmen, and after they came to the throne, they did not leave Iran. Despite being Turks, they considered themselves Iranians. They made Persian the official language of the court of the Seljuq sultans, and like

between the 11th and 19th centuries, the role and position of Persian literature can be recognized. Alisher Navoiy, the poet of the Transoxiana area, sent his thirty-three ghazals to Ahmed Pasha, one of the poets of the Ottoman period, in the 15th century. These are his ghazals that attracted Ahmed Pasha to Persian literature. (Çelik, 2021)

This approach has significantly contributed to the development of Persian literature and the literature of the Transoxiana region in the field of Ottoman literature. Such an approach is very similar to the distance education system used today. From this historical incident in the field of literature, it can be understood that the main link and bridge of cultural and literary exchange between Anatolian literature and Transoxiana literature is Persian literature, which was concretely manifested during the Ottoman Empire period. Of course, the role of Nezami Ganjavi among the poets of Azerbaijan's literary field is undeniable. This poet in the 16th century AD is one of the Persian-speaking but authentic Azerbaijani poets who positively impacted the poets of the East (Transoxiana) and the Turkish language of Ottoman literature.

#### Statement of the problem and discusión

Nezami is the poet of heartwarming love songs. His works reflect true, sincere love. The genuine, beautiful love Nizami wrote about is entirely in line with the facts of the real world. It is a unique example of a story that celebrates love literally.

From the Nizami point of view, speech and poetry are tools for conversation and creating beauty, but they have a place beyond that in the creation system. Therefore, in addition to creating outstanding literary works from the point of view of aesthetics, he always seeks to explain the critical issues of ontology and teach the basics of thinking about the system of existence and its levels of existence. In this intellectual system, poetry and poetics are an essential part of the levels of existence in the two areas of creation and the continuation of the purpose of the prophets from the point of view of awareness. They are among the most critical levels in the service of sacred affairs and in line with the supreme creation system. (Vaezi, Mohabbati et al., 2024).

Although Nizami did not name his five works, Khamsa, after his death, his "Khamsa" became very famous in Eastern literature and influenced the works of writers. Many Uzbek, Tajik, Azerbaijani, and Turkish poets started writing "Khamsa". Amir Khosrow Dehlavi, Amir

Alisher Navoiy, and Abdul Rahman Jami creatively followed Nizami Ganjavi's method in their literary works. Among those who have succeeded in this direction, we can mention Amir Alisher Navoiy, whose poems are written in Turkish-Uzbek and are incomparable with the works of other Asian poets.

It should also be noted that Nizami traditions existed in Turkish literature before being developed by the poets and writers of the Transoxiana region. However, many literary figures in the Transoxiana region influenced the development of Persian and Turkish literature in the Eastern world by adapting the tradition and style of Nizami Ganjavi in Khamsa's writing. Among them, Amir Alisher Navoiy has a unique, prominent role.

#### The effect of Ganjavi's five Nizami treasures on poets and writers in the Transoxiana:

At the beginning of the 14th century, the Uzbek poet Qutb Khwarizmi, Fakhr al-Din Yaqub ibn Muhammad Fakhri from the Aydin Oglular dynasty, who lived in the Isa Bey palace, as well as Yusuf Sinan Sheikhi and Muhammad Efendi Eshghi, who were famous in their time, were among the poets of the 15th century in Transoxiana region were considered to be the ones who translated Khosrow and Shirin's poems and Nizami Ganjavi's seven figures (Haft Peykar) into Turkish. At the same time, Heidar Khwarizmi, who also lived in the 15th century, translated another work of Nizami Ganjavi called "Makhzan al-Asrar" into Turkish.

Qutb Khwarizmi, a poet and translator of the 14th century, wrote a work like the epic story "Khosrow and Shirin" in 1340-1342 AD, considered the only reliable source. This work, translated from Persian to Turkish, was copied in Egypt in 1383 AD by Barka Faqih Barukaz Adagu Qipchaghi and on the recommendation of Amir Qutlu Khajeh. This manuscript was registered in the National Library of Paris in 1914 with number 312.

The creative years of Qutb Khwarizmi correspond to the period when Khwarazm belonged to the Golden Horde "Olt'in Orda" state. The famous work of Khosrow and Shirin is a free translation of an epic of the same name written by Nizami Ganjavi. For some reason, this work was not widely distributed and did not become famous. (Herkmen, 2021)

Haider Khwarizmi from the Khwarazm region, who lived at the end of the 14th century and the

first half of the 15th century, is considered a poet and one of the representatives of classical Uzbek literature. Information about his life and works can be found in Dowlatshah Samarkandi's "Tazkirat al-Shu'ara" (Memoirs of the Poets), "Majalis un-Nafais," "Muhâkemetü'l-Lugateyn" and "Makhzan al-Asrar" by Amir Alisher Navoiy. Heidar Khwarizmi wrote a copy of Nizami Ganjavi's "Makhzan al-Asrar" and presented it to Sultan Iskandar under the name "Golshan al-Asrar" in Turkish (1409-1414). In terms of design and belief aspect, his work is close to Nizami Ganjavi's epic, and its weight is the same as that written in "Bahr Aruz" (method of poem) and contains six hundred and thirty-nine verses. Unlike Nizami Ganjavi's work, this work is presented first with the story and then with the summary and conclusion chapter and thoughts arising from this story.

Among other famous literary figures of the Transoxiana region, we can mention Amir Alisher Navoiy, whom Nizami Ganjavi's Khamsa also inspired. It is known that Alisher Navoiy wrote one of his self-made stories with a different style and opposite to Nizami Ganjavi's "Laili and Majnoon" and created it in Turkish. Due to his profound mastery of storytelling traditions, he gives new clothes to his stories and breathes the Turkish spirit into him. Muhammad Fuzuli also follows the path of innovation in his fiction writing and presents an attractive Oghouzi in Turkish with comparative analysis. In particular, the introduction to the story of Laili and Majnoon by Alisher Navoiy and Muhammad Fuzuli elevates this love story to a new level.

Khamsa is written in the East with more than 50 examples, and different expressions. But not all the old works have reached us. After Nizami Ganjavi, his Khamsa has been translated and composed in Turkish, Urdu, Pashto, Kurdish, and other languages based on sources. With time, in certain socio-political conditions, they have a theme, composition, images, and definition, which have changed to some extent regarding the content and structure of all written Khamsa. The tradition of Khamsa writing has continued in the Caucasus, Central Asia, Afghanistan, Pakistan, and India, and the interest in writing Khamsa in the Turkish language in folk literature began in the 13th and 14th centuries.

In the above passages, it was mentioned that Qutb Khwarizmi in the story of Khosrow and Shirin and Haider Khwarizmi in Makhzan al-Asrar were able to maintain a poetic format like Nizami Ganjavi despite the translation of the work into Turkish and Uzbek. Of course, in the

meantime, due to a lack of familiarity with the Turkish poetic style, they had made some changes, which was inevitable. Because Turkish poems were often written in syllables. Alisher Navoiy is one of Transoxiana's poet significant poets and writers of the 15th century. He considered writers such as Nizami Ganjavi, Amir Khosrow Dehlavi, and Abdul Rahman Jami as his teachers.

The peak of Alisher Navoiy's work can be seen in his immortal work, "Khamsa," written between 1485 and 1483 AD. This poet was among the first to create a complete "Khamsa" in Turkish and proved that such a great work could be written in Turkish.

In this work, Alisher Navoiy admits that his work called "Khamsa" is a continuation of Nizami Ganjavi's work, which is called "Panj Ganj" or "Khamsa." He writes these verses at the beginning of his book:

**Emas oson bu maydon ichra turmoq, Nizomiy panjasig'a panja urmoq.**

*"It is difficult to stay in this field, and putting a paw in the Nizami paw is difficult."*

To some extent, Alisher Navoiy promoted the genre of "Khamsa" in its kind, made it famous in the literature of Turkic-speaking peoples, and considered their creativity. He skillfully developed his ideological and artistic methods and style. Qanuni is one of the other literary figures of the past eras who further developed Khamsa and positively impacted the continuation of Nizami Ganjavi's style in Khamsa's writing. So, different stories were written in the Middle-Asia Turk tribes. Poets like Uzbek Khaja wrote "Maqsood al-Atwar." A Turkish poet named Lemoui from the Uzbek tribe and a Uyghur poet named Nizari adapted the story of "Farhad and Shirin," and Muhammad Fuzuli, an Azerbaijani poet, created "Leili and Majnoon."

The methods of Ferdowsi, Nizami, and Dehlavi were updated through the stories of Alisher Navoiy, and the same process played an essential role in solving the main problems of Turkish classical literature. In this regard, we can mention the works of Ahmad Rizvan, Jalili, Harimi, Bafqi, Urfi Shirazi, the stories of Lemoui, Nizari, and many other stories that were later adapted from Nizami Ganjavi.

Therefore, it can be said that Nizami Ganjavi is one of the poets who, despite his numerous works, his work "Panj Ganj," which is known as

"Khamisa Nizami," has been able to influence Turkish poets more than his other works because the poets of Eastern literature and especially the Transoxiana area have written several examples or adaptations in Turkish from his Khamisa and even separate volumes in the past centuries and imported them into Turkish literature. Some Turkish poets rejected prosaic poetry due to its incompatibility with the poetic structure of Turkish oral literature and tried to use syllabic poems. Still, famous poets such as Nejati Bey, Ahmed Pasha, Sheikhi, Suleiman Chalabi, and Alisher Navoiy have used Nizami Ganjavi's works and started composing lyrical poetry in Turkish classical literature. Writing sonnets was a priority for Turkish poets compared to other poems. Because lyric writing was counted as a kind of superiority and skill in creating a literary work. If the name "Divan literature" is mentioned in the review of classical literature, it is due to the literary influence of Nizami Ganjavi on Turkish classical literature. Because with Ghazal, Divan literature in Turkish has grown and developed. (Uzgor, 2023)

Ghazal has been the leader in the past ages, which has been an influential factor in the influence of Persian literature on Turkish literature. For a work to be called Divan, it was necessary to have a lyric section. A work that consists only of the sonnet section is considered a Divan Poem.

Alisher Navoiy expresses the importance of Ghazal for Divan as follows:

**"Dîvân tapılğay kim anda ma'rifet-âmîz gazel tapılmağay ve gazel bolğay kim anda mev'izet-engîz bir beyt bolmağay mundak dîvân bititse hod asru bî-hûde zahmet ve zâyî'i meşakkat tartılğan bolğay."**

*"With this explanation, he says that: When Diwani is composed, if there is no wise sonnet in it and if there is no instructive couplet in the sonnet; If Diwan is written in this way, the efforts made will be wasted."*

In Divan's poetry, the theme of love is generally raised in the content of the sonnet format. About love, which is characterized by all kinds of characters, the lover, the beloved, and the rival, the poet in Divan often takes the lover's side and considers himself one with the beloved. A poet who falls in love in his poem evaluates his position in the field of love. The criteria in these evaluations are great love heroes such as

Majnoon, Farhad, and Karam, who have become part of the public cultural heritage. Especially the claim of the superiority of Majnoon's character is remarkable, which is why the story of Leili and Majnoon has been considered necessary by the poets of Turkish literature and even Shir Navoiy, who resorted to it. (Ustuner, 2007)

The poets of Turkish literature, especially in the Ottoman period, considered Nizami Ganjavi an authentic and imitable literary reference. While expressing their poems' literary value, they appealed to Nizami and pointed to him. For example, Zati, one of the 16th-century poets of the Ottoman period, expressed the following statement to prove the prominence of his sonnets in the court: "If Nizami had seen my poetry, he would have appreciated and approved me as a poet."

**Nizâmî görse bu ebyât-ı penci Deye idi Zâti'yâ pençen burılmaz**

Or Edirneli Nazmi, another poet of Turkish literature in the same century, says: "Know that if Nazmi's poetry were seen as a Ganjavi style, he would certainly consider you a pearl from the poetry treasures in terms of his poetic ability."

**Nazmiyâ Gence Nizâmîsi göreydi nazmun Tab'-ıla genc-i dür-i nazmdurur dirdi sana**

When Turkish poets of the Ottoman period were hesitant about their poems and literary compositions or could not make sufficient conclusions about them, they resorted to the Ganjavi method. Especially in translating Persian poems, they benefited from Nizami's thought and interpretation. So, Sunbulzadeh Vehbi, one of the other poets of the Ottoman period, admitted the following in the 18th century. (Yenikale, 2012)

**Nizâmî hamsesinde bâ-sarâhat Demişdir şi'r için cüz'-i nübüvvet**

*"Nizami has clearly stated in his poetry that poetry is a part of prophecy."*

As mentioned above, the poets of Turkish literature, especially in the Ottoman period, considered Nizami Ganjavi a master poet and were influenced by him. The poets of many areas of Turkish literature, including Choghatai, Azerbaijani, and Anatolian, criticized other poets, especially in "Fakhriyeh's poems,"<sup>4</sup> they never had the courage or the courage to make

<sup>4</sup> If the poet praised himself in the poem he wrote, that type of poetry was called Fakhriye.

negative comments about Nizami Ganjavi. They always flaunted their superiority by comparing the Nizami poems of Ganjavi. If the poets of Turkish literature were to compare themselves with prominent poets, they would undoubtedly compare themselves with Nizami because they saw him as superior to them. It is as if it was necessary that they used Nizami Ganjavi's spirituality to produce their literary works in terms of the aesthetics of poetry and the greatness of the concept and acknowledged his adaptation. This can also be seen in Alisher Navoiy's Khamsa. (Türkben, 2015)

Although it was a habit among the poets of the Ottoman period to prove their prominence in comparison with the famous and great poets of the past, in no way can you find a work or an example in which the poets of the Ottoman period and other poets of the Turkish world associate themselves with Nizami. In proving their superiority and talent, most Turkish poets always mentioned the greatness of great poets at the beginning of their work, considered them their teachers, and then claimed they were equally talented poets. In other words, they proved their superiority in the clothes of famous old poets like Nizami Ganjavi.

The reason for such an approach by the poets of the past era was Turkish literature derived from the power of words and the literary image of Nizami Ganjavi. One of Nizami's most essential and prominent ideas in his worldview is the views related to the two fields of theology and literature. In a better way, Nizami Ganjavi has presented a vast collection of thoughts with literary views in the connection of these two views, and even from a theological point of view, he has presented an ontological interpretation. By studying Nizami Ganjavi's works, we can conclude that he expressed his intention in all his works, especially in the introduction to the poems, so skillfully and masterfully that it is evident that he is experienced in the science of rhetoric. Nizami Ganjavi makes a man mighty in proving his opinions, beliefs, and morals and makes the necessary proofs capable without being doubtful.

Since the science of theology can be used to determine the state of origin and resurrection according to Islamic law, Nizami's works confirm that he has always sought to discover and interpret the universe and raise awareness about it. In many cases, he also refers to his constant efforts in this field. Also, poetry and poetry relate to religious and theological beliefs in this intellectual system. (Halabi, 1994)

### **The role of Alisher Navoiy in the development of Nizami Ganjavi's thought:**

The Nizami's Khamsa has gained world fame as the endless legacy of Nizami Ganjavi. For the reasons mentioned above, this work contains teachings on theology and ethics that have attracted most Turkish poets and writers. Nizami Ganjavi's works, especially Khamsa, had a significant impact on the artistic thought of Turkish literature through prominent masters, as it is a concrete word and conforms to the traditions of the Eastern poet. Alisher Navoiy is one of the prominent writers of the Eastern world who continued Nizami traditions in the new literary base and gained an excellent reputation, a magnificent position, and a unique position and became different from other writers in the Transoxiana region.

Alisher Navoiy, the writer and master of the genius of the Uzbek people, combined the high human ideals that Nizami Ganjavi brought into the history of Eastern artistic thought with the unique features of Turkish literature. He preserved the moral ideal and the environment of that time and enriched it with supplements from the folk literature of the Turkish people. It is not a coincidence that the followers of Turks, especially Anatolian classical literature, used the Nizami literary school in their works and benefited from the creativity of the great Azerbaijani and Persian poets. The transmission of Nizami Ganjavi's thought and theology penetrated Anatolian and Ottoman classical literature through Navoiy from the 15th century onwards.

Alisher Navoiy, the poet, genius, and thinker of the people of Uzbekistan, is among the prominent wordsmiths who continued Nizami traditions in a new context and achieved great success in this field. He distinguished himself with his position. A poet who was closely familiar with the achievements of the classical poetry of the East until his time he turned to Nizami art with endless love. First, Ganjavi's Nizami art expresses, explains, and understands humanity, loyalty to the nation's cause, respect for hard workers people, respect for women's dignity, human skill, and intelligence. Secondly, the belief in the power of science and other similar qualities was in harmony with Navoiy's creative nature, which made the resonance of Nizami Ganjavi's speech manifest again in Alisher Navoiy's Khamsa with high human ideals in Uzbek literature and the field of Choghatai literature. This process caused a close connection between the rich Persian and Turkish literature.

That is why a poet who worked on the themes written by his predecessor from a new perspective and entered a creative competition with him achieved great success in the world of art and immortalized his name among the rare geniuses of the world.

As mentioned, Khamsa Navoiy is adapted from Ganjavi's timeless work Nizami's Khamsa. However, Alisher Navoiy's Khamsa is among the worthiest or first places among other classical poetry of the East. This work, written in the poet's mother tongue (ancient Uzbek), has been widely published among Turkish-speaking people since its creation and has been loved and studied to this day. The importance of the work is so great that it is not only in the Uzbek language, which has been translated into the world's living languages. This success has doubled the honor and importance of Alisher Navoiy and even Nizami Ganjavi. From this point of view, Navoiy is considered a capable artist who played an exceptional role in expanding the sphere of influence of his predecessor and increasing the worldly fame of Nizami's works. The fact that Khamsa Navoiy has been expanded many times in the literature of Turkic peoples and found new successors is a complex issue that needs extensive research. In this research, an attempt has been made to clarify the critical role of Alisher Navoiy in expanding Nizami traditions in Turkish artistic thought and gaining global love.

Alisher Navoiy took an utterly original path and reviewed the primary sources of the works of his predecessor, Nizami Ganjavi, by adapting examples of oral literature and from colorful narratives and folk tales that have Ganjavi themes as well as the works of the poet in the folk creativity of Turkey was associated with exploitation. In his works, he was able to reflect on the daily life of the Turkish people, the climate governing the environment, and the motivations related to the native land in his works. He was able to present the spirit and feeling of Turkish words in the creativity of his predecessor in a more straightforward way. In all his poems, Alisher Navoiy deals with the incidents and stories that happened, and he is happy to say that by writing his works in the Uzbek language, he acts differently from his predecessors. In his first poem, called "Hairat ul-Abrar," this poet says while talking about the authors of Khamsa before him:

**Форси чу бўлди аларға адо,  
Турки ила қилсам ани ибтидо.  
Форси эл топти чу хурсандлик  
Турк дағи топса барумандлик** (Arasli, 2020)

*"The predecessors wrote their works in Persian. I started writing them in Turkish. The people of Fars are happy about this. Let the Turks use it."*

In another place, by mentioning this point, he considered the Persian works of Turks to learn and understand the contents. He requested that Turkic peoples should benefit from the content of Khamsa just like Persian languages. He expresses this matter as follows:

**Ул тил била назм бўлди малфуз.  
Ким, форси англр ўлди махзуз.  
Мен туркча бошлабон ривоят,  
Қилдим бу фасонани ҳикоят  
Ким, шухрати чун жаҳонға тўлғай,  
Турк элига доғи баҳра бўлғай.  
Невчунки букун жаҳонда атрок.  
Кўптур хуштабъу софи идрок** (Navoi, 1991)

*"Those who understood Farsi enjoyed the words read in that language. I started narrating the narration in Turkish. I narrated (said) this legend so that its fame would reach the world and the Turkish people would benefit because there are many well-mannered and pure-minded Turks worldwide."*

However, Alisher Navoiy expanded this tradition, prominent in Turkish literary and artistic thought, with his Khamsa in Uzbek. By introducing the works of Nizami Ganjavi, who was considered one of the predecessors of the world of literature, Alisher Navoiy was able not only to translate Persian literature into Turkish and provide a bridge between the two languages and literature but also to express the opinions of the eternal artist of Persian literature, namely Nizami Ganjavi. To introduce Turkish poets and lovers of poetry and art and people who love literature and customs and to strengthen the emotional, human, and literary relationship between Persians and Turks.

Of course, during that period, most of the Turkish poets wrote their texts in Persian, and this caused the ancient tradition of the Turks to be forgotten. Alisher Navoiy, by writing Turkic and authoring Khamsa and Muhâkemetü'l-Lugateyn, made the Turkish-speaking people present their oral literature in written form based on tradition and with reasonable direction. In this way, the literary Turkish language found a special place. Perhaps, if the content of Nizami Ganjavi's works with their translation by Alisher Navoiy did not impact the people, oral literature could not have successfully passed the path of becoming written literature. (Golkarian, 2017)

By translating Nizami Ganjavi's works, Alisher Navoiy made Persian literature clear and understandable for Turkish speakers. She created works translated into Turkish and authored Khamsa to explain folk oral literature. The way of life of Turk people revealed their family and ethnic characteristics.

In the end, it can be said that Alisher Navoiy was a pioneer and founder of Khamsa writing in Transoxania. Therefore, after him, people like Beheshti, Jalili, Ahmad Rizvani, Hayati, Moeidi, and other "Khamsa" writers benefited from Navoiy's creativity in Turkish literature. Characters such as Farhad, Shirin, Bahram, Khosrow, Iskandar, and other Khamsa warriors, under the influence of new motifs and episodes related to the Turkish environment, lifestyle, manners, and traditions, created unique characteristic lines in Turkish epic poetry.

### Conclusions

Khamsa Nizami is one of his prominent works that has influenced ancient Persian and Turkish literature. If today, Turkish literature is familiar with his personality and mastery of the science of rhetoric and literature, it is indebted to the poets and writers of the 15th century AD, especially Amir Alisher Navoiy. By translating and adapting Nizami's works, he recognized Nizami Ganjavi in different fields of Turkish literature in other dimensions and aspects. Alisher Navoiy's literary influence continues to influence the literature of the Turkic peoples in Central Asia, especially the Republic of Turkey. With folk creativity, Turkish artists create outstanding and exciting works of art by relying on folk literature and benefiting from Nizami and Navoiy traditions. The poets of Turkish literature from the 16th to the 18th centuries saw numerous examples, which have been mentioned in the research.

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## Implementation of innovative information technologies in judicial proceedings: organizational and legal aspect

### Впровадження інноваційних інформаційних технологій у судочинстві: організаційно-правовий аспект

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#### Abstract

This work aims to study the organizational and legal aspects of implementing the latest information technologies (IT), including artificial intelligence (AI), in the justice system. The study was based on a comprehensive approach that integrated analytical methods, comparative analysis, the case study method, and risk assessment. It is determined that to improve the existing regulatory framework on the use of IT in the judicial system, it is necessary to regulate the following organizational and legal aspects: I. enshrine compliance with ethical principles, ensure information security, and define responsibility for the risks of using AI systems at the legislative level; II. develop unified standards and requirements for algorithms, models, and data used in AI systems that support the information activities of courts;

#### Анотація

Метою роботи є вивчення організаційних та правових аспектів впровадження новітніх інформаційних технологій (ІТ), зокрема штучного інтелекту (ШІ), у систему правосуддя. Дослідження ґрунтувалося на комплексному підході, який інтегрував аналітичні методи, компаративний аналіз, метод кейс-стаді та оцінку ризиків. Визначено, що для вдосконалення існуючої нормативно-правової бази з питань використання ІТ у судовій системі необхідно врегулювати наступні організаційно-правові аспекти: I. закріпити на законодавчому рівні дотримання етичних принципів, забезпечення інформаційної безпеки та визначення відповідальності за ризики застосування систем ШІ; II. розробити єдині стандарти та вимоги до алгоритмів, моделей та даних, які

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IV. provide proper guarantees for respect for human rights, prevention of discrimination and bias in the use of AI in legal proceedings; V. ensure transparency of legal regulation, which will increase public confidence in the use of AI technologies in the judicial system; VI. ensure flexibility and adaptability of legal regulation, and promote harmonization of the regulatory framework at the international level through the adoption of generally accepted principles and unified standards for the use of AI systems.

**Keywords:** judicial system, organizational and legal support, legal regulation, information technologies, digitalization, artificial intelligence, European integration, international experience, smart technologies, court.

## Introduction

The latest information technologies, in particular artificial intelligence (AI), machine learning (ML), and big data analytics, are rapidly evolving and penetrating critical areas of modern technologized society, including law enforcement agencies, the judicial system, and the security sector. The global digital transformation has encompassed the justice system in recent years, which is responsible for upholding laws and protecting the rights and freedoms of citizens. The judiciary is adapting to the latest challenges and megatrends by implementing digital platforms and utilizing data analytics capabilities.

Artificial intelligence is considered one of the most significant achievements in the field of information technology. This cutting-edge technology has penetrated all sectors of modern digital society and is being actively implemented in the judicial systems of different countries, including Ukraine. AI is called one of the most promising technologies of the future due to its extraordinary functional capabilities that go far beyond human abilities. Judicial bodies have accumulated huge arrays of various legal data that require prompt and high-quality processing. This information is constantly being updated from various sources, so powerful technological tools are needed for its analysis. The problem of effective processing of legal data has become particularly acute in the context of Russia's full-scale war against Ukraine and the need for

застосовуються в системах ШІ, що забезпечують інформаційну діяльність судів; IV. передбачити належні гарантії дотримання прав людини, запобігання дискримінації та упередженості при використанні ШІ в судочинстві; V. забезпечити прозорість правового регулювання, що сприятиме підвищенню довіри громадськості до застосування технологій ШІ в судовій системі; VI. зумовити гнучкість та адаптивність правового регулювання, сприяти гармонізації нормативно-правової бази на міжнародному рівні шляхом ухвалення загальноприйнятих принципів та уніфікованих стандартів використання систем ШІ.

**Ключові слова:** система судочинства, організаційно-правове забезпечення, правове регулювання, інформаційні технології, діджиталізація, штучний інтелект, євроінтеграція, міжнародний досвід, smart технології, суд.

careful documentation of war crimes by international standards.

AI tools can optimize this process and provide rapid and high-quality analysis of evidence. They are capable of obtaining data from sensors that go beyond human perception and processing visual, audio, geospatial, and tactile information. The logical capabilities of AI systems surpass those of the most powerful computing systems. The application of probabilistic analytics and fuzzy logic based on parallel and quantum computing allows for more accurate modeling of biological systems even under conditions of uncertainty and incomplete data.

Modern AI systems can be considered intelligent, as the complexity of data representation in them often goes beyond human comprehension even after computer analysis. This creates a risk of misinterpreting AI results and even losing human control over such systems. Of particular concern is the uncontrolled use of AI in judicial proceedings, which can lead to serious threats and violations. To prevent these risks, it is necessary to develop clear legal frameworks and ethical norms for the use of AI in the judicial system, ensure proper supervision and control, and take measures to combat bias and protect human rights. To date, in the science of information law, there has been no comprehensive analysis of the organizational and legal foundations for the implementation of innovative IT in the judicial proceedings of

countries around the world and the judicial system of Ukraine. Therefore, there is an urgent need to conduct comprehensive multidisciplinary research on this issue.

This article aims to investigate the organizational and legal aspects of implementing the latest IT in the justice system. To achieve this aim, the possibilities of using innovative technologies in the digitalization of judicial proceedings have been studied; the current state of international and domestic legislation in the field of AI has been analyzed; and proposals have been made to improve the legal regulation of the use of AI in Ukraine.

### Literature Review

The topic of research on the comprehensive analysis of the organizational and legal foundations for the implementation of innovative IT in judicial proceedings is quite new and under-explored in domestic science. This issue has an interdisciplinary nature, as it lies at the intersection of several fields of knowledge – information law, jurisprudence, and information technology. The issue of applying machine learning, big data, and artificial intelligence in judicial proceedings is being actively researched in developed countries, where these technologies are already finding practical applications. These issues were discussed in the works of the following authors: Münch & Ferraz (2024), Demertzis et al. (2023), Ho et al. (2020). However, in Ukraine, this topic remains under-explored in legal science. It is addressed only in separate works by the following researchers: Berezka et al. (2022), Kovalchuk et al. (2022), and Kovalchuk et al. (2023). The few publications by domestic scholars touch only on certain aspects of the problem of digitizing judicial proceedings, including Turkanova (2023), Teremetskyi et al. (2023), Kovalchuk & Teremetskyi (2023). However, comprehensive studies on the implementation of AI in the judicial system from an organizational and legal perspective are practically non-existent. The legal foundations of the organizational support of the activities of the courts of Ukraine are dedicated to the works of the following authors: Pavlyuk (2020), Goncharuk & Bielova A (2022), Svitlychnyi (2023). Thus, this study has a high degree of scientific novelty, as it is one of the first in Ukraine to comprehensively consider the opportunities, challenges, risks, and legal aspects of using AI in the judicial system based on an analysis of global experience. Due to the lack of a sufficient range of national scientific research, particular attention is currently required to

address the issues of improving the organizational and legal support of the activities of courts based on the use of data science methods and innovative IT, as well as adapting legislation in the field of digital technologies and data, including AI, by EU norms. The improvement of legal norms on the widespread use of AI in the judicial system also remains relevant.

### Methodology

This study employed a qualitative research approach combining multiple methods to develop evidence-based recommendations. Specifically, a documentary analysis method was used to critically review relevant scientific literature, international documents, and legislative acts from different countries, including Ukraine, related to the regulation of AI in the judicial system. A comparative analysis method was applied to study and compare different approaches to the legal regulation of AI across various countries worldwide. Furthermore, a case study method was implemented to examine practical cases of implementing digital technologies and AI systems in the judicial systems of selected countries.

To ensure methodological rigor, the documentary analysis followed a systematic process of searching, screening, and analyzing relevant documents based on predefined inclusion and exclusion criteria. The comparative analysis involved a structured framework to evaluate and contrast AI regulation approaches across countries based on key dimensions such as scope, principles, and enforcement mechanisms. For the case study method, a purposive sampling strategy was employed to select relevant cases that demonstrated diverse applications of AI in judicial processes. Triangulation of data sources, including official reports, legal documents, and expert interviews, was conducted to enhance the validity and reliability of the findings.

Additionally, a risk and opportunity analysis was carried out to comprehensively assess the potential benefits, challenges, risks, and threats associated with the use of AI in the field of justice. This analysis was informed by the insights gained from the documentary analysis, comparative study, and case examinations, as well as input from subject matter experts and stakeholders.

Based on the cumulative findings from the various methods employed, specific proposals

and recommendations were formulated to improve the legal regulation of AI use in Ukraine's judicial system, addressing identified gaps, mitigating potential risks, and capitalizing on opportunities for enhancing judicial processes through responsible AI adoption.

## Results and Discussion

### *Use of IT Technologies in Digitalization of Judicial Proceedings Worldwide*

In countries with high crime rates, such as the United States, the digital modernization of the justice system is actively taking place through the implementation of statistical methods, machine learning, artificial intelligence, and big data analytics. However, predictions made by machines are not accurate, and the cost of errors increases sharply when artificial intelligence is applied in critically important areas related to life, security, and freedom of people. Meanwhile, the justice system is becoming increasingly technologically complex, and its effectiveness depends on processing vast amounts of unstructured and disorganized data.

Artificial intelligence technologies are increasingly being used in the justice system to predict the likelihood of crimes and their recurrence, assess risks in determining bail or punishment, as well as to establish a person's guilt or innocence (Yu et al., 2020). Law enforcement agencies in developed countries are actively involving predictive methods to identify potential offenders, and crime victims, and identify criminals. The application of machine learning technologies in the judicial system can be extremely useful. One of the key advantages of AI is the ability to effectively analyze previous court decisions in similar cases to reduce the number of biased verdicts (Mathis, 2022).

Computer vision and image recognition algorithms can automatically analyze video surveillance, and identify people, license plates, weapons, and other important details, helping investigators find key evidence more quickly (Gkougkoudis et al., 2022). Machine learning technologies can analyze vast amounts of financial data to detect suspicious transactions, money laundering, fraud, etc., finding complex patterns invisible to humans (Shetty et al., 2023). AI algorithms can assess the risk of former prisoners re-offending based on historical data to determine the necessary monitoring and rehabilitation measures (Berezka et al., 2022). AI systems can quickly analyze large databases of previous court decisions to search for relevant

precedents in the current case, helping lawyers build more substantiated arguments. By analyzing large data on previous sentences, AI systems can assist courts in determining optimal sanctions, taking into account various factors, and reducing the risk of unjustifiably severe or lenient punishments (Alghazzawi, 2022). Machine learning can detect potential systemic bias in the decisions of individual judges based on race, gender, age, etc. AI algorithms allow for efficient scheduling of court hearings, taking into account the complexity of cases and the availability of participants. Based on an analysis of data on past proceedings, AI systems can more accurately predict the expected duration of different categories of cases (Shaikh et al., 2020).

Many progressive countries are actively implementing a probation system, which allows individuals convicted of non-serious crimes to be released and begin the process of reintegration into a law-abiding society. Probation legislation and its functioning are regulated by national laws and regulations of each state, which may include different rules, procedures, and standards depending on the region. In Ukraine, probation is regulated by legislation that establishes the conditions and procedures for the execution of this type of punishment, with the key regulatory act being the Criminal Executive Code of Ukraine. However, there is a risk that courts may impose overly lenient sentences, creating potential threats to public safety. A dilemma arises: to ensure the safety of society or to give convicts a chance for resocialization and correction. To make such decisions, reliable information support is needed – the application of a scientific approach and artificial intelligence algorithms, including the creation of predictive models to determine the likelihood of recidivism among convicts (Berezka et al., 2022).

There is also a “sensitivity and specificity dilemma”: what is more important – to prove the innocence of a potential suspect (risking their impunity) or to protect the rights of an innocent victim? Because of this, crime facts are often silenced by victims due to a feeling of insecurity based on negative experiences from previous cases where the guilty went unpunished. Solving crimes is a complex task that requires significant resources and expertise. Intelligent data analysis models can provide effective solutions for non-standard crime investigation problems. Artificial intelligence algorithms are increasingly being used in predictive justice, including the qualification of crimes and their conformity with criminal proceedings. Text analysis algorithms provide reliable support in building an evidence

base, judicial analytics, and making informed decisions during proceedings (Ma et al., 2021).

Traditionally, law enforcement agencies have acted reactively – arresting criminals after crimes have been committed. However, the emergence of the latest technologies, such as intelligent data analytics and artificial intelligence, has opened unique opportunities for predicting and preventing crime. New tools effectively gather information from various sources (databases, geospatial data, social media, news) and detect hidden connections and patterns. The exponential growth of data volumes has led to the need for scalable algorithms for information analysis. Today, predictive policing actively uses AI predictive algorithms to identify criminals by facial features, assess the risk of recidivism, predict likely crime sites, monitor social media, and more. Artificial intelligence systems are used at various stages of criminal proceedings: to determine the possibility of parole, and participation in probation, calculate optimal prison terms, and assess the defendant's danger.

In the high-tech society of the 21st century, questions arise about recognizing humanoid robots as legal entities, the feasibility of granting them citizenship, and protection from global AI threats. AI systems can be used for facial and human silhouette recognition, tracking, and information search on social networks. Such technologies to some extent violate the right to privacy, but at the same time, they make it possible to make a balanced decision. Private data can be encrypted, not stored, and not disseminated to minimize risks.

The issue of the impact of AI on ensuring transparency, fairness of justice, and the rule of law remains unresolved, creating new opportunities and threats for legal systems. For example, judges and lawyers may use AI systems to obtain recommendations on decisions in court cases, which could facilitate the decision-making process and help avoid bias. However, there are risks in the field of justice related to human rights violations or case law if AI decisions are erroneous or the system is used for malicious purposes.

Already today, judicial systems in many countries around the world use digital tools such as electronic document management systems, video conferencing, analytical systems, AI, cloud services, etc., which optimizes workflows and increases productivity. International experience in implementing innovative IT in the judicial system demonstrates a general trend toward

digitalization and automation of judicial processes. For example, Singapore has an advanced eLitigation electronic litigation system (Heng, 2023), Estonia has a fully digital court system (Maakohtu, 2023), the UK uses an advanced video conferencing and electronic document exchange system (James, 2020). The UAE uses artificial intelligence for document translation, case distribution, and retrieval of judicial practice (Park & Chai, 2021). Canada is implementing solutions for automatic order generation, evidence management, and transcription of meeting records (Alcántara Francia et al., 2022). Brazil uses digital case management systems, electronic signatures, and judicial statistics analysis (Reiling & Contini, 2022). China is developing a “Smart Court” system based on AI, voice recognition, and big data analytics to automate judicial proceedings (Zheng, 2020). Some U.S. states use AI systems for legal materials search, case outcome prediction, and risk analysis (Sajida et al, 2023). The introduction of innovative AI technologies, machine learning, big data analytics, and digital tools in the judicial system opens up new opportunities to improve the efficiency, accuracy and transparency of justice, but requires careful consideration of ethical aspects, security assurance, and respect for human rights.

#### *Application of Innovative IT Technologies in the Digitalization of the Judicial System of Ukraine*

The judicial system of Ukraine is currently only at the initial stage of digital transformation. Its goal is to ensure the unity, transparency, openness, accessibility, and human-centricity of justice. In the context of the rapid development of digital technologies, the digitalization of judicial proceedings is considered an objective necessity for creating an effective, independent, and impartial judicial system, which is an integral component of building Ukraine as a legal European state. The digitalization of the court is part of the State Anti-Corruption Strategy.

Ukraine has a Unified Judicial Information and Telecommunication System (UJITS), which provides automation of judicial processes, document flow, office work, analytics, and communication between courts through electronic data exchange, video conferencing, electronic digital signature, and other services. Its legal basis is the Law of Ukraine “On Access to Court Decisions” (Law of Ukraine No. 3262-IV, 2005) and resolutions of the Cabinet of Ministers “On Approval of the Procedure for Maintaining the Unified State Register of Court Decisions” (Law of Ukraine No. 1200/0/15-18,

2018). One of its subsystems is the “Electronic Court”, which allows filing claims and documents electronically and participating in hearings via video conferencing. The UJITS also includes the Unified State Register of Court Decisions since 2006, but it is still operating in test mode with functional limitations. Since March 2023, it has been possible to receive notifications about cases and decisions in digital format through the “Diya” application (Kibenko, 2023). The digital transformation of the judicial system of Ukraine can increase its efficiency, accessibility, and transparency through the use of the latest technologies. However, the European integration processes and the active war with Russia impose new requirements on digital justice in Ukraine, which can only be met on a solid legal foundation (Ablamskyi et al., 2023).

The application of ML and AI in the legal field opens up wide opportunities to increase efficiency, optimize processes, and ensure greater fairness in the justice system. However, AI systems are not neutral and safe. AI-based decisions can be inaccurate, and discriminatory due to built-in biases, and become a new source of errors and data leaks. AI algorithms can inherit biases from training data and make biased decisions based on race, gender, socio-economic status, etc., violating the principle of equality before the law. Many AI models are difficult to explain and interpret, which can undermine trust in the judicial system. AI systems can make mistakes due to incomplete, outdated, or biased training data, causing erroneous judicial decisions with serious consequences.

The use of AI in justice also poses risks to human rights and due process without proper safeguards. There is a threat of malicious use or manipulation of AI systems in judicial proceedings to achieve biased goals. In case of errors, it is unclear who should be held responsible – developers, data providers, or judges. This creates serious risks to confidentiality, fairness, respect for human rights, and other fundamental values. The application of AI in the justice system can pose several risks and threats if it is not properly regulated and controlled.

#### *Legal Regulation of Artificial Intelligence in the World*

One of the most progressive and promising technologies of our time is AI. Thanks to the rapid development of computer computing power and cloud technologies, AI systems can operate with huge amounts of data and perform complex calculations in record time. Machine

learning allows AI systems to self-learn from data, identify complex patterns, and adapt to new situations. AI has wide applications in various fields, which determines its interdisciplinary nature. Due to intensive research and investment, AI technologies are constantly improving, expanding their capabilities and areas of application. This causes additional ethical and legal challenges in the use of AI algorithms. Its progressive nature also requires careful study of the ethical and legal issues associated with ensuring security, transparency, and respect for human rights.

Currently, there is no universal international legislation that would comprehensively regulate the field of AI. However, several international organizations are developing recommendations, guidelines, and standards in this area. In particular, the United Nations, through UNESCO, in 2021 adopted the Recommendation on the Ethics of AI, which calls on states to develop legal regulation of AI based on the principles of respect for human rights, inclusiveness, equality, privacy protection, etc. (Ramos, (s.f)). The Organization for Economic Cooperation and Development (OECD) in 2019 adopted the OECD Principles on Artificial Intelligence, defining standards for the responsible use of AI in the interests of people and society (OECD, 2019). In 2021, NATO endorsed the Principles on the Use of AI to ensure the responsible and ethical development and implementation of AI technologies in the defense sphere (Taddeo et al., 2021). The International Organization for Standardization is developing technical standards related to AI. International legislation in the field of AI is still in its early stages of development, and most countries are only shaping national approaches to regulating artificial intelligence.

Different countries approach the regulation of the AI field differently, but many have already developed or are developing relevant regulations. The United States does not have a single federal law on AI, but there are separate initiatives and bills at the state level. For example, in California, there has been an artificial intelligence law in decision-making since 2022 (Bosley et al., 2023).

China pays close attention to the comprehensive development of AI and the formation of an appropriate legal framework. In 2017, the National Plan for the Development of Emerging Industries was adopted, which sets a course for leadership in AI. In 2020, the “AI Standards Guide” with recommendations for its use was published. It is planned to develop regulations on

the ethics, security, and regulation of AI. China is developing a comprehensive state policy to stimulate research, development, and application of advanced AI technologies, as well as forming a legislative framework to ensure a balance between innovation and risk control (Tu et al., 2022). In 2023, the UK presented a White Paper on flexible AI regulation and a code of practice (Kurth, 2023). In 2022, Canada adopted the Directive on Automated Decision-Making Systems for the public sector and is developing a draft AI Act (Canaan, 2023). In 2019, Japan approved the Data Business Development Strategy and the Artificial Intelligence Strategy, and AI legislation is expected to be developed (Maruyama & Nicola, 2022). In 2023, Singapore updated its National AI Strategy and is shaping regulatory approaches to prevent risks (Kaur, 2023). In 2023, India presented a draft National AI Policy (Dumouchel, 2023). Most countries recognize the need to regulate AI to ensure security, ethics, and respect for human rights, but specific approaches vary depending on national priorities.

#### *Legal and Regulatory Framework for Using AI in the Ukrainian Judicial System*

In Ukraine, the situation with regulating the use of AI at the regulatory level is formal and needs further improvement and more active concrete actions to determine the ways of its application. Currently, there is no separate legal act that would comprehensively regulate the use of AI in the judicial system. The digitalization of legal proceedings is a dynamic process that requires constant updating of the legal and regulatory framework, as well as information and technical support. On May 26, 2021, the Law of Ukraine On Amendments to Certain Legislative Acts of Ukraine Concerning the Gradual Implementation of the Unified Judicial Information and Telecommunication System came into force (Law of Ukraine No 1416-IX, 2021). This law was adopted by the Verkhovna Rada of Ukraine on April 27, 2021, to ensure the gradual implementation of the Unified Court Information and Telecommunication System (UCITS) (Teremetskyi & Duliba, 2023). Ukraine has been developing and discussing AI legislation, but no AI law has yet been officially adopted. It is actively exploring the possibility of creating a regulatory framework for AI and studying the experience of other countries.

In Ukraine, there are legislative acts that relate to certain aspects related to AI, such as data protection, intellectual property, cybersecurity, etc. However, the current legislation contains

only isolated references to the use of information technologies in legal proceedings, but without details regarding artificial intelligence. Issues of ethics, safety, and responsibility in the use of AI also need to be regulated. It is necessary to clearly define the range of tasks and processes where AI can be used in legal proceedings, establish requirements and standards for algorithms, models, and data for AI systems in courts, and provide guarantees of human rights and avoidance of bias. Transparent regulation will help increase trust in the use of AI in legal proceedings. An important issue is the adaptation of the legal and regulatory framework for judicial information systems in Ukraine to European legislation and the improvement of the principles of their functioning to ensure the possibility of easy integration with EU systems.

#### **Conclusions**

The analysis of the state of application of AI tools in the judicial systems of countries around the world shows that artificial intelligence algorithms are being actively implemented in the judicial systems of many countries, including Ukraine. This optimizes judicial processes, increases the efficiency of the judicial system, and ensures fair justice. The use of AI in legal proceedings opens up wide opportunities but also carries risks and threats related to bias, violation of human rights, loss of control, and undermining trust in the judicial system. At the international level, recommendations, principles, and standards are being developed for the ethical and responsible use of AI, but there is still no universal legislation. Most countries in the world are forming national approaches to the legal regulation of the AI field, but specific solutions differ depending on priorities.

In Ukraine, there is currently no comprehensive legislative regulation of the use of AI in the judicial system, with only isolated mentions in regulations without details. For the effective implementation of AI in the Ukrainian judicial system, it is necessary to develop a clear legal framework, establish requirements and standards, provide guarantees of human rights, and avoid bias, as well as adapt legislation to EU norms. Today, there is an urgent need to establish a proper legal basis to ensure the safe, ethical, and responsible application of artificial intelligence technologies in the justice system of Ukraine.

To improve the current legal and regulatory framework, which only partially mentions the use of information technologies in legal

proceedings, but does not detail the application of artificial intelligence, it is necessary to regulate several organizational and legal aspects: I. regulate compliance with ethical norms, ensure information security, and assign responsibility for the risks of using artificial intelligence; II. clearly outline the range of tasks and processes where AI can be used in legal proceedings; III. establish uniform requirements and standards for algorithms, models, and data for artificial intelligence systems in courts; IV. provide guarantees for observing human rights, avoiding discrimination and bias in the application of artificial intelligence; V. ensure transparent regulation that will help increase public trust in the use of artificial intelligence in legal proceedings.

AI is constantly evolving, so legislation in the field of its application needs constant improvement and adaptation to new realities. Rapid progress in this area poses new challenges. To ensure the safe, ethical, and responsible use of AI technologies, it is necessary to regulate the following organizational and legal aspects at the level of laws and regulations: I. periodic review of existing norms and standards, since with the development of AI, new risks or problem areas may emerge that will require regulatory regulation; II. flexibility and adaptability of legal regulation to ensure the development of innovation while simultaneously setting clear boundaries and limitations to prevent abuse or violation of human rights; III. harmonization of the legal framework at the international level through the adoption of common principles and standards for the use of AI. IV. Consideration by the legislation of ethical principles such as transparency, accountability, non-discrimination, confidentiality, and protection of personal data in AI systems; V. involvement of all stakeholders - developers, businesses, civil society, experts – in the process of forming AI policy and legislation to ensure a balanced approach.

Legislation regulating the creation and use of AI systems is developing in many countries and does not yet have clear international standards. Laws and regulations can vary across different regions and include issues around safety, copyright, data privacy, liability for harm caused by a robot, and many other aspects. However, it is important to consider issues of privacy, ethics, and accountability in the context of using artificial intelligence in the justice system. Guarantees are also needed that AI algorithms and systems do not discriminate against any group of people and adhere to the principles of

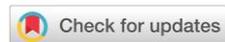
fairness. The use of AI in legal proceedings can have both positive and negative impacts on case law and human rights violations. It is important to ensure that the use of these technologies is fair, effective, and meets the requirements of human rights and justice.

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## Emergent properties of modern education

### Емерджентні властивості сучасної освіти

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#### Abstract

The article reveals the essence, content, and advantages of emergence and shows the possibilities and situations of using the word "emergence" and its derivatives. Analyzing the ways of development of an emergent society, the integrity and emergence of synergistic education, and the importance of an emergent educational modern innovative system in a higher education institution are shown. Augmented reality (AR), considered a technology that is necessary in the educational sector today, emergent properties of the educational space are highlighted – informatization, virtualization, and digitalization. An experiment was conducted to identify the expediency of using AR technology in the educational process in general and the higher school, in particular, to ensure the emergence of the educational space as a final result. We were asked to assess the level of training of each respondent, in particular, the ability to use AR technologies. The obtained

#### Анотація

У статті розкрито сутність, зміст, переваги емерджентності та показано можливості та ситуації використання слова «емерджентність», його похідні. Аналізуючи шляхи розвитку емерджентного суспільства, показано цілісність і емерджентність синергетичної освіти, важливість емерджентної освітньої сучасної інноваційної системи у закладі вищої освіти. Доповнена реальність (AR), розглянута як технологія, яка необхідна в освітньому секторі сьогодення, виділено емерджентні властивості освітнього простору – інформатизація, віртуалізація, діджиталізація. Проведено експеримент з метою виявлення доцільності використання технології AR в освітньому процесі взагалі і вищої школи, зокрема, з метою забезпечення у кінцевому результаті емерджентності освітнього простору. Нами було запропоновано завдання оцінити рівень сформованості кожного респондента, зокрема, уміння використовувати

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results showed that the majority of teachers and future specialists assess their own level of formation of the use of AR technologies as low and average – 78% of respondents and 22% – as sufficient and high. This indicates the expediency of using AR technology in the educational process in general and higher education, in particular, to ensure the emergence of the educational space as a final result.

**Keywords:** emergence, institution of higher education, augmented reality, informatization, virtualization, digitalization.

## Introduction

The modern world has resolutely shifted the epicenter of human existence to the pole of self-organization and "non-linearity" when the universe appears through multidimensionality. In the modern scientific discourse, in search of the fundamental foundations of existence, there is an increasing trend of methodological reorientation from a stable state to a state of constant formation, from a single to a multifaceted one, from identity to differences, which is connected with the emergence of a new post-nonclassical, non-linear type of thinking (Fedoryshyn & Tkach, 2023).

The modern system of higher education is constantly being modernized, actualizing the search for new educational strategies for the development of higher education in the conditions of a global pandemic, which involves the revision of existing forms, the optimization of meaningful components of the organization of the educational process by the new, in the educational space, communication conditions. In the educational process of the higher education system, special emergent properties appear successively, which help the system to update itself without losing its quality indicators. "Today, the emergence of something new in the education system is perceived as reality, and only the unpredictable threat of viral infection from COVID-19 reveals elements with emergent properties in the system" (Puchkov & Uvarkina, 2021). Each person has unique knowledge that makes him stronger and benefits the group during training and professional activities, and emergent systems help achieve a positive result. Knowledge exchange occurs when the team receives new facts and uses them in the process of discussing ideas and projects for the implementation of innovations. Therefore, the

AR технології. Отримані результати засвідчили, що більшість викладачів та майбутніх фахівців оцінюють власний рівень сформованості використання AR технологій як: низький та середній – 78% респондентів та 22% – як достатній та високий. Це говорить про доцільність використання технології AR в освітньому процесі взагалі і вищої школи, зокрема, з метою забезпечення у кінцевому результаті емерджентність освітнього простору.

**Ключові слова:** емерджентність, заклад вищої освіти, доповнена реальність, інформатизація, віртуалізація, діджиталізація.

study of emergent properties of modern education is important and necessary today.

## Literature Review

Studies of the emergent properties of modern education, and their impact on the professional activity of an individual are the subject of scientific research in psychology, philosophy, and pedagogy. Let's analyze such studies. N. Heseleva and N. Zaritska (2013) provided the basics of the emergent properties of the education system, defined and considered approaches to the meaning of the concept of "emergence", and clarified the emergent strategies of enterprise management. Similar studies were conducted by O. Puchkov, & O. Uvarkina (2021) in particular, emergent properties were analyzed in modern education. The actualization of the search for new educational strategies that contribute to the development of higher education in the conditions of a global pandemic is shown. Integral components of modern education are singled out. It has been proven that digitalization, virtualization, and informatization are becoming essential in the educational sector, and the concept of nomadism can become the conceptual basis for the formation of modern educational strategies. It is clear that "special emergent properties consistently appear in the educational process, which helps the system to update without losing its quality indicators".

G. Woolcott, S. Leonard, A. Scott, R. Keast & D. Chamberlain (2021) respond to a growing literature arguing that change in higher education institutions might be better understood and managed if such institutions are understood as complex systems with emergent properties. The study finds evidence of subsystem variations on the initial partnership priorities, including

substantial boundary crossing, leading to emergence and co-evolution, indicating that a macroscopic view of emergent variation rather than 'micromanaging' may be an essential factor in scaling and sustaining collaborative partnerships.

V. Fedoryshyn, & M. Tkach (2023) examines in the context of the convergence of scientific research polyparadigm principles and strategies of knowledge the interdisciplinary nature of scientific research in the field of higher education, shows the ways of using modern innovative approaches in the content of education with prominent signs of non-linearity: emergent, reflexivity, irreversibility, multidimensionality, etc. In the studies, the problem of the formation of a non-linear new post-non-classical type of personality thinking was considered, which led to a deepening of methodological reflection in the field of humanitarian knowledge. In this regard, it was determined that "transitional orientations of professional training of students require the implementation of several non-linear approaches, the defining features of which are an interdisciplinary synthesis of knowledge, methodological pluralism, polyvariance of search vectors, interdisciplinary connections, strengthening of integration interaction, etc." It is proved that the problem of "explication of the modern non-linear paradigm, its systematicity, multifacetedness, and complexity requires the synthesis of the entire complex of sciences, represented by synergy, and humanitarian knowledge, represented by the philosophy of postmodernism".

A. Stepanyuk, L. Mironets, T. Olendr, & I. Tsidylo (2022) conducted experiments to prove the effectiveness of the proposed methodical system. It has been established that in the conditions of the information society when implemented in the educational process of a higher school, it contributes to the improvement of the quality of training of future specialists for educational activities. A list of educational disciplines has been defined: "Innovative learning technologies", "Digital technologies in professional activity", "Digital technologies in education and science", and "Theory and teaching methods", which are expedient to form a person's professional skills in different ways. Despite the existing scientific works on the systematic analysis of the educational sector, the issues of emergent properties of the educational system remain insufficiently studied.

**The purpose of the article:** the study of emergent properties of modern education.

### Methodology

To ensure the achievement of the goal, a set of methods was used in the research process:

- theoretical: analysis of scientific research aimed at the researched problem, with the aim of systematic comparison of different views, regarding the organization of the educational process and the study of professional experience;
- empirical: use of interviews, surveys, observation methods, questionnaires. Conducting conversations with teachers and students of higher education institutions about the ways of using augmented reality in the educational process, clarifying the difficulties and advantages of specialists that exist when using augmented reality in the educational process, the sufficiency of access to technologies to be able to use augmented reality, etc., to ensure in the end the emergence of the educational space; conducting a pedagogical experiment;
- statistical: registration and processing of experiment results using computer programs, in particular MS Excel and SPSS, for statistical processing of the obtained data.
- The experiment was conducted on the expediency of using AR technology in the educational process in general and higher education, in particular, to ensure the emergence of the educational space as a final result.

To study the state of implementation of the problem in teaching practice, a questionnaire was conducted to find out the use of augmented reality in the educational process, what difficulties and advantages specialists have when using augmented reality in the educational process, whether access to technologies is sufficient to be able to use augmented reality, whether the use of augmented reality improves academic achievement of students, or whether augmented reality should become an important component of the educational process.

The experimental research took place according to the following stages: organizational-methodical, educational-processual, and reflective-analytical.

The organizational and methodological stage involved the study of the research problem and

substantiation of theoretical questions, the determination of priority research and methodology, with the help of which the methodology of familiarization with AR applications is developed, the special training of specialists in the use of AR technologies and the use of modern forms and methods of learning to achieve the set goal.

The educational and procedural stage provided for two academic years in which 86 students of master's level education participated, who were included in the experimental group (EG). The obtained results were compared with the control group (CG), which included 98 respondents.

The reflective-analytical stage of the research included the analysis of the results of experimental training according to objective indicators – the activity of using AR technologies in pedagogical practice, adaptability to the requirements of the information society, and subjective indicators – self-analysis of the level of readiness to use AR. Students were asked to answer the questions of the questionnaire after the experimental training.

We conducted a study of teachers and students of higher education institutions to determine the level of their ability to use AR in their professional activities. It was proposed to assess the level of education of each respondent, in particular, the ability to use AR technologies. The obtained results showed that the majority of teachers and future specialists assess their own level of formation of the use of AR technologies as low and average – 78% of respondents and 22% – as sufficient and high. This indicates the expediency of using AR technology in the educational process in general and higher school, in particular, to ensure the emergence of the educational space as a final result.

## Results and Discussion

### The essence, content, and advantages of emergence.

Outside the mode of self-development, education is an externally controlled process of "processing human material."

The situation does not change radically even when educational material is processed based on the best ideals. The educational space, despite all ideals, cultivates power relations within which everything innovative and new is "caused by the old". Moreover, the latter leaves a mark on anything innovative and new and thus enables its

existence to be only an imitation of self-organization in the educational process. After all, self-organization and self-development cannot be "generated" by causes that are external to these processes. It is important to consider that creativity is a concentration of the sphere of self-development. From this follows the conclusion that the "constitution of educational space as an "emergent" system is impossible without creative activity" (Kremen, 2014). The readiness to choose from alternatives to the emergence of a new one enables creativity, and non-linear thinking as the ability to ensure further self-development, to reorient to new dimensions. Creativity is a kind of technology for generating everything new.

Creativity is capable of systematically organizing the present through a controlled expansion of perception of reality and transformation as the future.

As a result of fluctuations, something new emerges as unpredictable, emergent, in the form of a multidimensional spectrum of possible paths. Emergence is the presence in any system of special properties, the appearance, the emergence of something new in the theory of systems that is not characteristic of its blocks and subsystems, as well as the sum of elements that are not connected by system-forming ties. Emergence is such processes that occur in the process of discovering the properties of small parts that, through a simple process of choosing between several simple options, exist beyond the capacity of a single individual.

Emergence directs the creativity of the individual, its creative construction in the mode of self-organization of the thinking process. "In this sense, creativity differs from creativity, as the generation of new knowledge, by the ability to use already existing relevant properties, connections, relationships, albeit hidden ones. Creativity involves the creation and design of such properties from already existing elements" (Landau et al., 2021).

The ideals of the educational process developed in the past should be critically reconsidered for the self-organization of the individual in the context of their adequacy. For this, it is necessary to take as a basis the elements of the "emergent" system of all participants of pedagogical activity – the interaction between such elements generates a qualitatively new result, unexpected and unique to human existence. In this case, education is the ability of a person to independently realize various personal ways of

existence in his own life, it serves as a gift for all its participants (Kremen, 2014).

So, the emergence and appearance of a new emergent in the theory of systems contribute to the creation of an innovative system of special human properties that are not inherent in the blocks of subsystems, the sum of elements that are not connected by system-forming ties.

The advantages of emergent systems are that they:

- change the attitude towards information, and its values;
- do not replace the government,
- innovatively change the preferences of the wishes of the majority over the wishes and prescriptions of the minority.

In these processes, the Internet plays a key role, because it provides an opportunity for individuals to participate in discussions, in discussions that until recently were only possible for individuals, not for all of humanity, and could not be heard by society (Maraví, 2021).

#### **Possibilities and situations of using the word "emergence" and its derivatives.**

We will reveal the possibilities and situations of using the word "emergence" and its derivatives.

Emergence is such processes that take place outside the capacity of a single individual, when many small parts reveal precisely such properties that create actions through a simple process of the individual and allow a choice to be made between several simple options.

Thanks to the Internet, the birth of emergent democracy became possible – a kind of collective intelligence, a new political phenomenon. Humanity got the opportunity to challenge the authority of respectable institutions through amateur blogs. Emergence allows this system to significantly exceed the capabilities of each individual (Chuc & Riveroll., 2022).

The human brain is the most amazing example of emergence. Out of 20 thousand genes, a third of them are in the human brain. Each neuron is not conscious by itself, but when connected, all neurons form a network, and this exceeds the sum of their parts and gives a person the ability to be so conscious that one can reflect on the thought process itself (Conejo & Carmiol, 2017).

#### **Development of an emergent society.**

Emergence systems include:

- each individual possesses knowledge that is useful and unique for the entire group;
- human knowledge makes a person stronger;
- in the process of discussing projects and ideas, there is an exchange of personal knowledge, which is formed in the process of studying at a higher education institution;
- during education, a team of higher education students receives new facts, which they use in their professional activities to implement innovations;
- creation of an educational platform for involvement in the development of an emergent society.

The spread of cheap or free online education is one of the important stages of emergence. This includes practical classes in various workshops, educational websites, and informal exchange of information with peers to combine parts into a whole and to create something qualitatively new in the educational process, without which there simply could not be an association. This property is called a certain resource of the system, i.e. emergence. That is, when we all gather together and work as a team, we achieve a more significant result than when we act individually.

"The theory of emergent evolution, the purpose of which is the recognition and interpretation of "jumpy" development and the emergence of something new, is relevant in our time. From the standpoint of the dialectical approach, emergentism leads to the denial of natural and historical patterns and the role of the quantitative stage of change in the development process (Fedoryshyn & Tkach, 2023).

#### **Emergent educational modern innovative system in a higher education institution.**

Considering the emergent educational modern innovative system in the institution of higher education as large, complex, dynamic, and open, the organization of which is determined by the tasks of professional training and the goals of education, improving the qualifications of branch specialists of education, management workers, the following integrative features are highlighted:

- manageability and purposefulness (the presence of a general purpose, a general goal that is adjusted and set by society);
- innovativeness of the emergent system (the

presence of properties that are integrative and cannot be deduced from the known properties of individual elements of the system);

- the structure of the organization is hierarchical and complex (presupposes coordination with the autonomy of elements, subsystems, and centralized management);
- multi-criteria;
- multi-connectedness of system elements (the connection between levels of the hierarchy and at the same level);
- the complexity of relationships between variable, and dynamic parameters;
- multidisciplinary specialists;
- the presence of external information connections and multiple internal connections between system elements and their subsystems;
- multiple changes in composition and transition from one state to another;
- probability of conflict situations;
- the presence of internal disturbing factors of competing parties and external ones.

The signs listed above make it possible to conclude that this emergent educational modern innovative system in a higher education institution is differentiated into separate systems and subsystems of different levels of complexity and orderliness. At the same time, the subsystems are interconnected, their components interact with each other and are coordinated, which causes radical changes in the professional development of a person in the conditions of optimization and intensification of the educational process (Puhach et al., 2021).

#### **Emergent properties of educational space – informatization, virtualization, digitalization.**

In the educational process of a higher school, special emergent properties appear successively, which help the emergent system to update itself without losing its quality indicators. Virtualization, digitalization, and informatization transform educational processes towards the latest technologies, contribute to the development of the modern personality of the 21st century, become integral components of world educational systems, and form new mobile forms of thinking in the space of education (Thorne et al., 2021).

Today, in the education system, the emergence of something new is perceived as a reality. Only the threat of viral infection from COVID-19, which is unpredictable, or military conflicts in the world manifest themselves more and more and

accelerate the pace of development in the system, providing an opportunity for the development of elements with emergent properties.

Global informatization is one of such properties that influenced the development of education and covered all spheres of society. Today, the informatization of education acts as a communication and defining information base of the educational space, which ensures the harmonious development of the modern personality (Bida et al., 2022). The exponential nature of global informatization constantly reveals new properties of its own information system, affects the updating of technologies in education by the requirements of digitalization, and forms new social communication relations for all participants of the educational process in higher education. It is known that the systems of personality consciousness and communication systems are evolutionarily tuned to each other, thus unprecedented autonomization and formation of personality occur through informagenesis (Nazar, 2018).

The educational space contributes to increasing the effectiveness of information, unites the subjects of information genesis in our time, and creates conditions for the formation of an informational cultural field where personality is improved and developed.

Nowadays, the virtualization of a person as an emergent property of modern educational processes gives birth to a virtual personality that realizes real reality through information networks and becomes a full participant at all levels and forms of the educational process. The student of education is actively involved in intercultural communication, evolving towards the development of potential virtual opportunities, improves and studies English as the language of communication in global networks, self-realizes in virtual space and introduces new rules of virtual communication into information technologies, meaningful knowledge (emojis, abbreviations, etc). This virtualization of a modern student contributes to learning to overcome a stressful state, for example, during a pandemic, or to protect scientific work and creates the most favorable psychological and pedagogical interaction with the already formed virtual personality of the student of education (Uvarkina, 2020). In conditions of rapid growth of the role of information technologies, the digitalization of society is taking place, which leaves no choice to the educational system, in all spheres of social life, the network principle of organizing the

world community is emerging on the surface of global transformation. Quarantine restrictions and martial law, for example, in Ukraine, have formed a new virtual personality, a modern informational and educational space, which is related to the so-called "digital nomads", a special category of people. A feature of educational "digital nomads" was their mobility, which made it possible to transfer and receive professional skills, abilities, and knowledge remotely from various geo-locations with the availability of the Internet and modern means of communication. The majority of educators belong to a large social group of people who talk about the presence of "digital inequality". These are individuals who widely use and know computer systems in everyday life and professional activities because the digitalization of the entire society leaves no choice to the educational system. Teachers become subjects of education with emergent properties of modernity, become "digital nomad" or "digital literati" (Puchkov & Uvarkina, 2021).

#### **Integrity and emergence of synergistic education.**

Significant changes in the existence of national cultures and interactions led to globalization processes as a necessary attribute in the modern world.

A cultural gap occurs, under such conditions, the loss of traditional supports, and the transition to a polystylistic culture from a monostylistic culture, the main characteristics of which are emergence, dynamism, openness, non-linearity, etc. The formation of a new type of society (post-industrial, technotronic, informational) actualizes the role of a creative, creative personality.

The principle of emergence "characterizes complex open self-organized systems in terms of the emergence in them of new, integrative qualities that appear due to the combination of individual components of the system, which were not characteristic of neoplasms."

The emergence of integrative qualities determines the emergence of a system that appears not due to a simple rearrangement or addition, but the unification of some of them and a lower level of organization. This explains the emergence in modern society of qualities essential for the functioning of the individual, which appear:

- due to the combination of individual skills and knowledge – qualities of a lower level;
- formation of competencies – qualities of the highest level.

Therefore, in the coordinates of modern science, the personality should be considered by pedagogy and philosophy of education as a synergistic system – emergent, complex, capable of self-organization, self-development, coherent, open, and dissipative.

As a constant movement from one state of the system to another, from the point of view of synergy, the development of the individual appears, in which randomness, chaos, passage of bifurcation points, destruction, creation, etc. are natural states of the system, which build a continuous chain of transformations, successively change each other. It is impossible to predict and perceive personality development as a dependence on "pedagogical pressure" – the organization of the educational environment, educational influences, the amount of involved efforts and means, etc. The possibility of personality development is embedded in the structure of the personality itself – it is a potential that can be spontaneously realized in one of many options.

In the process of its development, the personality is constantly in a state where it acts as a component of another coherent system. It is necessary to take into account the laws of the phenomenon of "excessive influence on the system, which can lead to a change in its structure, which is explained by the occurrence of resonance, in which a small fluctuation (deviation, oscillation) can change the state of the entire system."

Therefore, mastering the definitions of synergetics and understanding concepts is natural from the point of view of pedagogical theory and philosophical-educational theory. The scientific thesaurus includes the following units:

- personality as a synergistic system;
- principles of personality organization as a synergistic system – emergence and dissipativeness, non-linearity of development, openness, coherence, imbalance; bifurcation points; fluctuations; too little impact; catastrophe.

The emergence and integrity of synergistic education in the developed countries of the world are manifested in the predominantly endogenous nature of the formation of mechanisms, factors,

conditions of activity of the subjects of the educational process, and intellectual and cognitive growth of the individual (Kremen, 2014).

**Emergence is an important feature of the educational environment that determines its quality as a system.**

Emergence is an important feature of the educational environment that determines its quality as a system. Emergence in the educational environment indicates that the designed model of the educational space is more complex than the sum of its constituent elements (Sajoza Juric, 2019).

Speaking about the structure of the educational environment of the light space, it is worth paying attention to the coherence of its parameters, as the ability, in the process of carrying out its educational functions, to the mutual coordination of the actions of various microenvironments. The educational environment as a system:

- is in dynamics and constant movement;
- needs modeling;
- requires monitoring and adjustment.

Therefore, we conclude that the positions of scientists regarding the definition of the concept of emergence, integrity, and emergence of synergistic education, emergent properties of the educational space, and structural elements of the educational environment differ significantly, which confirms its characterization of emergence as a complex, integral formation that includes certain components with multiple relationships languages of the socio-pedagogical system.

In the process of structuring an educational environment or an educational environment, researchers single out the material-spatial (visual, spatial-semantic, object-spatial, etc.) component as important and necessary for transformations in all periods of a person's life. The subject-spatial factor of educational situations determines the dependence on material factors, such as classrooms, provision of the educational process with computers, auxiliary literature, and textbooks, the building of the educational institution, recreational facilities, research area, etc. (Demchenko, 2014).

**Augmented reality (AR) is a technology that is necessary in the education sector today.**

The study of any subject of knowledge, which is a system formation, is connected with the

selection of the basic features characteristic of any system in general, including a plurality of components, subsystems, components, interaction, communication, system, system-forming, regular connections, structure, organization, hierarchy, integrity, and emergency (Stepanyuk et al., 2022).

Considering the emergent educational modern innovative system in the institution of higher education as a large, complex, dynamic, and open, the organization of which is determined by the tasks of professional training and the goals of education, improving the qualifications of industry specialists in education, management workers, the emergent properties of the educational space are highlighted – informatization, virtualization, digitalization, integrity is shown and the emergence of synergistic education.

Emergence directs the creativity of the individual, its creative construction in the mode of self-organization of the thinking process. In this sense, creativity differs from creativity, as the generation of new knowledge, through the ability to use already existing relevant properties, connections, and relationships (Hashim et al., 2022).

Global informatization is one of the main properties that influenced the development of education and covered all spheres of society. Scientists consider augmented reality (AR) as a technology that, with the help of computer applications, allows you to identify and create a virtual layer of information with a favorite object or marker that is in the physical real world. A graphic visual object can act as a marker that will be added to virtual objects of various formats using special software tools. AR technology allows you to superimpose text, images, video, and audio components on space and an existing image. The aura (received information) can be read from the marker using all kinds of digital devices, such as tablets, smartphones, AR helmets, AR glasses, etc. (Shetelya et al., 2023). Scientists define augmented reality (AR) by its characteristics or features. Stepanyuk et al. (2022) interpret augmented reality as a system that meets three characteristics, such as real-time interaction, a combination of real and virtual worlds, and accurate 3D registration of real and virtual objects. C. Lytridis, & A. Tsinakos (2018) offer the following definition: AR is "the technology of augmenting the physical world with the help of digital data provided by computer devices (smartphones, tablets, smart lenses, and AR glasses) in real time". The

features of AR are that "real and computer information are combined in the physical world, interactively in real-time, and the display of the virtual object corresponds to the orientation in the real world".

**An experiment on the expediency of using AR technology in the educational process in general and in higher education, in particular, to ensure the emergence of the educational space as a final result.**

To study the state of implementation of the problem in teaching practice, a questionnaire was conducted to find out the use of augmented reality in the educational process, what difficulties and advantages specialists have when using augmented reality in the educational process, whether access to technologies is sufficient to be able to use augmented reality, whether the use of augmented reality improves the academic achievements of students, whether augmented reality should become an important component of the educational process.

The experimental research took place according to the following stages: organizational-methodical, educational-processual, and reflective-analytical.

The organizational and methodological stage involved the study of the research problem and substantiation of theoretical questions, the determination of priority research and methodology, with the help of which the methodology of familiarization with AR applications is developed, the special training of specialists in the use of AR technologies and the use of modern forms and methods of learning to achieve the set goal.

The educational and procedural stage provided for two academic years in which 86 students of master's level education participated, who were included in the experimental group (EG). The obtained results were compared with the control group (CG), which included 98 respondents.

The reflective-analytical stage of the research included the analysis of the results of experimental training according to objective indicators – the activity of using AR technologies in pedagogical practice, adaptability to the requirements of the information society, and subjective indicators – self-analysis of the level of readiness to use AR. Students were asked to answer the questions of the questionnaire after the experimental training.

The study is based on the research scheme of Ukrainian scientists (Stepanyuk et al., 2022), the results of which show that:

- To the question "Do you use augmented reality in the educational process?" respondents answered: "Yes" – 72.8%, "No" – 24.1%, "If possible" – 0.7%, "Sometimes" – 0.9%; "Rarely" – 1.5% of respondents.
- To the question "Name at which stages of the lesson you use augmented reality?" 27.2% of respondents answered, "I don't use it at all." The received data in digital format fully corresponds to the results of the answers to the previous question. AR is used by 15.2% of respondents at the stage of the lesson, when previously submitted tasks are being checked, in the process of updating basic knowledge – 17.9% of respondents use AR when motivating educational activities – 39.9%, while at the stage of learning new material they use AR has the most respondents: clarification and expansion of information – 48.9%, perception of information – 47.9%, generalization, systematization of knowledge – 36.7%." Therefore, AR is used by most teachers and students to expand, clarify information, and motivate educational activities and their perceptions.
- To the question "What difficulties did you see when using augmented reality in the educational process?" the respondents had the following answers: the need for additional training – 71.9%; technical problems – 69.7%; limited availability – 38.9%; high cost – 22.5%; distraction of education seekers – 11.8%; futuristic – 6.9%; a large number of education seekers in groups – 0.9%; no – 0.7%.
- To the question "When using augmented reality in the educational process, choose which advantages do you consider to be the most important?" The answers were divided as follows: the development of an emergent educational modern innovative system in a higher education institution as a large, complex, dynamic, open organization, which is determined by the tasks of professional training and the goals of education – 61.8%, the development of creative thinking, informatization, virtualization, digitization of education, modeling, and simulation of educational processes – 60.9%, visualization of complex and abstract concepts – 46.9%, development of problem thinking – 28.9%, active participation of students and their interaction

- 27.8%, growth in the process of learning cognitive interest – 0.9%.
- To the question "Is access to technology sufficient to be able to use augmented reality?" teachers and future specialists gave the following answers: Yes – 40.8%; No – 62.2%. However, 99.7% of respondents expressed a desire to receive additional support or advanced training in the use of augmented reality.
- To the question for teachers and future specialists "Does the use of augmented reality improve the academic achievements of students?" they gave the following answers: "Yes" – 89.1%, "No" – 5.7%, "It is difficult to give an unequivocal answer" – 4.3%.
- To the question "What positive changes have you noticed in students during classes using augmented reality?" the answers were distributed as follows: motivation for the educational process increases ("Yes" – 96.7%, "No" – 3.3%); the student's cognitive interest increases ("Yes" is considered by 90.8% of respondents, "No" by 0.2%); the level of educational achievements of students increases ("Yes" – 95.0%, "No" – 0.5%).
- To the question "Do you think that augmented reality is or should become an important component of the educational process?", teachers and future specialists said: Yes – 94.1%; No – 5.9%.

To study the state of implementation of the problem in teaching practice, a questionnaire was conducted to find out the use of augmented reality in the educational process, what difficulties and advantages specialists have when using augmented reality in the educational process, whether access to technologies is sufficient to be able to use augmented reality, whether the use of augmented reality improves the academic achievements of students, whether augmented reality should become an important component of the educational process.

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applications is developed, the special training of specialists in the use of AR technologies and the use of modern forms and methods of learning to achieve the set goal.

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We conducted a study of teachers and students of higher education institutions to determine the level of their ability to use AR in their professional activities. We were asked to assess the level of education of each respondent, in particular, the ability to use AR technologies. The obtained results showed that the majority of teachers and future specialists assess their own level of formation of the use of AR technologies as low and average – 78% of respondents and 22% – as sufficient and high. This indicates the expediency of using AR technology in the educational process in general and higher education, in particular, to ensure the emergence of the educational space as a final result.

## Conclusions

We revealed the essence, content, and advantages of emergence and showed the possibilities and situations of using the word "emergence", and its derivatives. Analyzing the ways of development of an emergent society, the importance of an emergent educational modern innovative system in a higher education institution is shown. Augmented Reality (AR) is seen as a must-have technology in today's education sector.

Considering the emergent educational modern innovative system in the institution of higher education as a large, complex, dynamic, and open, the organization of which is determined by the tasks of professional training and the goals of education, improving the

qualifications of industry specialists in education, management workers, the emergent properties of the educational space are highlighted – informatization, virtualization, digitalization, integrity is shown and the emergence of synergistic education.

Global informatization is one of such properties that influenced the development of education and covered all spheres of society. Nowadays, the virtualization of a person as an emergent property of modern educational processes gives birth to a virtual personality that realizes real reality through information networks and becomes a full participant at all levels and forms of the educational process. In conditions of rapid growth in the role of information technologies, society is being digitized.

An experiment was conducted to identify the expediency of using AR technology in the educational process in general and higher school, in particular, to ensure the emergence of the educational space as a final result.

To study the state of implementation of the problem in teaching practice, a questionnaire was conducted to clarify the use of augmented reality in the educational process, the difficulties and advantages of specialists that exist when using augmented reality in the educational process, and to clarify the questions: is access to technology sufficient, to be able to use augmented reality; whether the use of augmented reality improves academic achievement of students; whether augmented reality should become an important part of the educational process, etc.

The experimental research took place according to the following stages: organizational-methodical, educational-processual, and reflective-analytical.

We conducted a study of teachers and students of higher education institutions to determine their level of formation of AR skills in professional activities. We were asked to assess the level of training of each respondent, in particular, the ability to use AR technologies. The obtained results showed that the majority of teachers and future specialists assess their own level of formation of the use of AR technologies as low and average – 78% of respondents and 22% – as sufficient and high. This indicates the expediency of using AR technology in the educational process in general and higher education, in particular, to

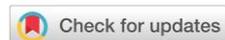
ensure the emergence of the educational space as a final result.

Consideration of innovative ways of digitalization of society requires further research.

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## Operative and search counteraction to crimes committed in the sphere of activity of institutional investors in Ukraine

### Оперативно-розшукова протидія злочинам, що вчиняються у сфері діяльності інституційних інвесторів в Україні

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#### Abstract

The purpose of this study is to analyze the methods, means and possibilities of operative and search counteraction to crimes committed in the sphere of activity of institutional investors. To achieve this goal, it is necessary to solve the following tasks: analyze the dynamics of crime in the sphere of activity of institutional investors; to characterize the concept and structure of operative and investigative countermeasures against crimes; determine the content of operative and investigative prevention, detection, and documentation of crimes in the field of activity of institutional investors. As a result of the research, it was possible to establish that in the structure of operational and investigative countermeasures against crimes in the field of activity of institutional investors, we distinguish

#### Анотація

Метою цього дослідження є аналіз способів, засобів та можливостей оперативно-розшукової протидії злочинам, які вчиняються у сфері діяльності інституційних інвесторів. Для досягнення цієї мети необхідно вирішити такі завдання: проаналізувати динаміку злочинності у сфері діяльності інституційних інвесторів; охарактеризувати поняття та структуру оперативно-розшукової протидії злочинам; визначити зміст оперативно-розшукового попередження, виявлення та документування злочинів у сфері діяльності інституційних інвесторів. В результаті дослідження вдалося встановити, що у структурі оперативно-розшукової протидії злочинам у сфері діяльності інституційних інвесторів ми виділяємо попередження,

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prevention, detection, and documentation of criminal offenses.

**Keywords:** investment activity, institutional investor, operational and investigative countermeasures, crime prevention.

JEL Classification: E22, E44, G24, K14, K23, K42.

## Introduction

The activity of institutional investors is one of the risky types of economic activity, as it involves the management and disposal of other people's funds of citizen-depositors. A responsible investor always puts the public interests of all investors above the private interests of individuals (Toporetska, & Vazhynskiy, 2023). But in the case of conflicts between the interests of the institutional investor (his officials) and the interests of the depositor, if the institutional investor puts his private (business, selfish) interest or the interest of individual officials above the public interest (Vazhynskiy, 2023), it thus encroaches on public values and interests.

Such encroachment is manifested in the preparation or commission of criminal offenses. Such actions also encroach on the economic security of the state and the public's trust in the state. After all, the economic sphere permeates all spheres of public administration, and other spheres of national security depend on its level (Vazhynskiy et al., 2023).

The activity of institutional investors is a complex mechanism, intervention in which leads to destabilization of the activity of not only an individual institutional investor, but also its counterparties, affects the economic well-being of individual investors and, in general, public trust in the financial system of the state.

The question of the economic security of the state in terms of the activities of institutional investors has not been considered in Ukraine until now. At the same time, considering the involvement of a significant number of citizen-investors and the risk of public resonance, such criminal offenses are characterized by high latency, and therefore it is extremely difficult to detect and stop them by public methods. All these criminal offenses are very diverse, and therefore effective operational and investigative countermeasures are an important issue for effective countermeasures.

**The purpose** of this study is to analyze the methods, means and possibilities of operative

виявлення та документування кримінальних правопорушень.

**Ключові слова:** інвестиційна діяльність, інституційний інвестор, оперативно-розшукова протидія, попередження злочинів.

and investigative counteraction to crimes committed in the sphere of activity of institutional investors. To achieve this goal, it is necessary to solve the following **tasks**: analyze the dynamics of crime in the sphere of activity of institutional investors; to characterize the concept and structure of operative and investigative countermeasures against crimes; determine the content of operative and investigative prevention, detection, and documentation of crimes in the field of activity of institutional investors.

## Theoretical Framework

Several works by the authors of this article, which became the basis for the preparation of this article, are devoted to the issue of operational and investigative countermeasures to crimes in the economic sphere in Ukraine. In particular, the work is based on the system of operative and investigative counteraction to criminal offenses, which was proposed by A.M. Cherniak and M. L. Hribov and includes measures to prevent, detect and respond to crimes (Hribov, Cherniak, 2018). Proposals regarding specific operative and investigative measures within the scope of OSA, which allow to prevent, detect and document criminal offenses in the field of activity of institutional investors, are based on the fundamental work of Prof. M. A. Pohoretskyi regarding the functional purpose of OSA (Pohoretskyi, 2007), as well as taking into account the already developed proposals of M. Pohoretskyi, A. Cherniak, D. Serhieieva, R. Chernysh, & Z. Toporetska regarding cybercrime investigations (Pohoretskyi et al., 2022), financial fraud investigations (Pohoretskyi et al., 2019). Several works helped to establish the peculiarities of the ways of committing a criminal offense in the field of activity of institutional investors, which are important objects of search from the point of view of the implementation of OSA. In addition, the works of such Ukrainian scientists as V.I. Vasylynchuk, M.L. Hribov, O.M. Dzhuzha, I.O. Krepakov, D.Y. Nikyforchuk,

I.G. Proskurnyak, V.D. Pcholkin, V.V. Cherny and others.

## Methodology

The methodological basis of the study was made up of general scientific methods of cognition: the dialectical method of cognition of the phenomena of the surrounding reality and the comparative-legal method for establishing the mechanism of activity of the institutional investor and the mechanisms of criminal activity in the sphere of activity of institutional investors, methods of logic (analysis, synthesis, induction, deduction, analogy), economic analysis, absolute and comparative advantages and statistical methods for analyzing the dynamics of crime in a certain area, analyzing methods of criminal activity and providing proposals. In accordance with the system-structural approach, an assessment of the possibilities of operative and investigative activity, means and methods of countering this category of criminal offenses was carried out.

The dialectical method of cognition of the phenomena was used to learn the mechanism of criminal activity that takes place in the field of institutional investors, to build operational and investigative characteristics of this category of criminal offenses and to identify objects that are of operational interest for the purposes of OSA. The comparative legal method was used to study the legal basis of the activities of institutional investors to demystify the methods of legal activity and the methods of illegal activity. The methods of logic (generalization, induction, deduction, analysis, synthesis) were used during the generalization of the practice of making OSAs, determining the effectiveness of specific methods and measures, and formulating specific proposals for operative and investigative counteraction to this category of offenses. The system-structural method made it possible to formulate specific proposals for a comprehensive system of operational and investigative countermeasures against crimes committed in the sphere of activity of institutional investors.

## Results and Discussion

### Dynamics of crime in the sphere of activity of institutional investors

According to the results of the Global Economic Crime and Fraud Survey, 47% of organizations in the world have been affected by fraud in the last two years. According to the results of the study, 51% of Ukrainian organizations suffered

from fraud in the last two years. This figure is higher than the global average (47%) and increased from 48% in 2018. In Ukraine, the leaders among the economic crimes that have affected organizations are misappropriation of property (47%), as well as bribery and corruption (47%), customer fraud (31%), cybercrime (31%) and fraud shared the second place in the field of procurement (31%) (Economic Truth, 2020).

Frauds with financial resources, which are often committed in the sphere of activity of institutional investors, are the most dangerous, as they significantly undermine the confidence of investors in such institutional investors and in the sphere of investing in general (Pohoretskyi et al., 2019). In the criminal legislation of most EU countries, the following types of financial fraud are distinguished: insurance - fraud committed in order to obtain the insurance amount; banking - fraud aimed at illegally obtaining bank loans, other loans or property preferences; criminal bankruptcy - fraud involving the creation of signs of insolvency or illegal actions in the event of enterprise liquidation; tax - cheating the state and its bodies, which consists in illegally reducing the amount of taxes payable or refunding VAT under export schemes; stock - fraudulent actions on the securities market and in stock exchange trading (Proskurnyak, 2016; Cherniei, 2014).

We suggest that criminal offenses in the sphere of the institutional investor's activities be divided into criminal offenses committed by other persons and directed against the institutional investor (external: clients, agents, other related business entities, who may or may not be in collusion with the employees of the institutional investor) and internal criminal offenses committed by employees of the institutional investor.

External criminal offenses usually involve the commission of various types of fraud (Article 190 of the Criminal Code of Ukraine) and forgery of documents (Article 258 of the Criminal Code of Ukraine). Internal criminal offenses can be committed by employees or with the participation of employees of an institutional investor and include: fraud (Article 190 of the Criminal Code of Ukraine), seizure of property (Article 191 of the Criminal Code of Ukraine), legalization of property obtained through criminal means (Article 209 of the Criminal Code of Ukraine) and are aimed at direct acquisition of the institutional investor's funds, which are accounted for in the investor's accounts.

A separate group of offenses consists of criminal offenses committed by officials of the institutional investor and destabilizing the entire economic activity of the institutional investor. These are: fraud with financial resources (Article 222 of the Criminal Code of Ukraine), Forgery of documents submitted for state registration of a legal entity and individual entrepreneurs (Article 205-1 of the Criminal Code of Ukraine), Bringing a bank to insolvency (Article 218-1 Criminal Code of Ukraine), Bringing to bankruptcy (Article 219 of the Criminal Code of Ukraine), Violation of the procedure for maintaining a database of depositors or the procedure for forming reports (Article 220-1 of the Criminal Code of Ukraine), Falsification of financial documents and reports of a financial organization, concealing the insolvency of a financial institution or grounds for revocation (cancellation) of the license of a financial institution (Article 220-2 of the Criminal Code of Ukraine), Manipulation in organized markets (Article 222-1 of the Criminal Code of Ukraine), Forgery of documents submitted for registration of the issue of securities (Article 223-1 of the Criminal Code of Ukraine), Production, sale and use of counterfeit securities (except state securities) (Article 224 of the Criminal Code of Ukraine), Concealment of information about the activity of the issuer (Article 232-2 of the Criminal Code of Ukraine) (Law No 2341-III, 2001). Such actions are often accompanied by official crimes, such as official forgery, official abuse, receiving or transferring illegal benefits.

Frauds committed by institutional investors are also widespread, which are divided into frauds during the attraction of funds and frauds during the investment of funds. Frauds during the attraction of funds are committed with the aim of seizing the funds of citizen-investors without the intention of investing them, usually this is the creation of so-called financial pyramids.

Investment fraud is committed in a variety of ways, but is usually combined with the business crimes we mentioned above. Usually, investment scams end in permanent insolvency or bankruptcy of the institutional investor. In this case, an important source of information will be all the documents drawn up during the implementation of the economic activity of the institutional investor. It is the documents that will make it possible to identify "weaknesses" in the activities of an institutional investor and to identify subjects of operational interest.

## **The concept and structure of operative and search countermeasures against crimes**

We share the position of M. L. Hrybov and A. M. Chernyak, who propose to include crime prevention, crime detection, and crime response units in the crime prevention system (Hrybov & Cherniak, 2018).

The operational-investigative characteristics of the crime are the starting point for the formation of a system of operational-investigative response to a certain group of criminal offenses. Giving the operational and investigative characteristics of this category of criminal offenses, we suggested including the following elements in it: an object of operational interest; subject of operational interest and conduct or event of operational interest. All these objects are important for various forms of implementation of OSA. We believe that the object of operational interest - the entire activity of an institutional investor - is important primarily for the prevention of criminal offenses in the field of activity of institutional investors, including for operational investigative prevention. The subject of operational interest comes to the fore during operational development, while the central object of an operational search is the conduct or event of operational interest, because it is this that is important for the detection of criminal offences.

## **Operative and search prevention of crimes in the sphere of activity of institutional investors**

We propose to highlight the following areas of prevention of criminal offenses in the field of activity of institutional investors:

- a) identification of the reasons for committing criminal offenses in the field of activity of institutional investors and conditions that contribute to their commission, implementation of measures to eliminate or neutralize them;
- b) identification of persons who can be expected to commit criminal offenses in the field of activity of institutional investors, application of measures to prevent them from committing offenses;
- c) prevention of specific criminal offenses committed in the sphere of activity of institutional investors at the stage of preparation or attempt to commit them.

Thus, we propose to consider the prevention of criminal offenses by operational investigative units as a type of individual operational prevention, which consists in identifying the causes and conditions that contribute to the commission of certain criminal offenses, and their elimination or neutralization, preventing the

criminal activity of certain persons (identification of persons, who are trying to commit a criminal offense, and the implementation of certain measures against them with the aim of preventing the implementation of their ideas, plans, preventing the transition from intention and planning to the stage of preparation for the commission of a criminal offense), as well as stopping the commission of criminal offenses (and the stage of preparation or attempt) with the use of opportunities, forces and means of operative and investigative activities is usually done secretly.

Prevention of criminal offenses by operational and investigative units, which involves operational work to prevent the commission of a criminal offense by a specific person (at the stage of the emergence of the intention to commit a crime and planning its commission), that is, the prevention of the transition of a person from the process of forming the intention to commit a certain criminal offense to the realization of a criminal intent (commitment preparatory actions for its commission, attempt or commission of a criminal offense) and always has its object of influence.

#### **Operational investigative detection and documentation of crimes in the sphere of activity of institutional investors**

Information about persons and facts of operational interest, as a rule, is the property of a limited circle of persons who are interested in hiding this information and for this purpose use various methods of masking. Therefore, the intensity of receiving primary information depends on the correct implementation of a number of organizational and tactical measures related to the determination of the direction of the operational search, the provision of this area of work with the necessary forces and means, the organization of clear interaction of various police services in the performance of this task. Operational workers do not have specific, predetermined information about the object of operational search. The process of detecting crimes and the persons who prepare or commit them is based on the knowledge of the event of the crime by isolating from the environment the changes that occurred in connection with its preparation or implementation. These changes can be detected by traces left on elements of the environment, such as documents, objects, as well as persons in whose consciousness information about the crime event is stored.

Factual data about a committed criminal offense in the field of activity of an institutional investor is obtained by the subjects of the OSA during an operational search, which is one of the main forms of the implementation of the OSA, the essence of which is to identify persons and facts that are of operational interest to the subjects of the implementation of the OSA (Pohoretskyi, 2009).

So, if a criminal event and the traces formed by it are objective categories that do not depend on their knowledge, then actual data (information about them) is a subjective category, since these data (information, data about a criminal offense) are perceived by a specific person (subject). The same thing happens in operational and investigative activities, where the perception of data about a criminal offense is carried out by the relevant subjects of the OSA. Therefore, the perception by any person (subject) of objective circumstances (factual data about a criminal offense) is always subjective (Pohoretskyi, 2008).

Therefore, employees of operational divisions must: have knowledge of the provisions of regulatory acts that regulate the implementation of financial activities, investment activities, banking, insurance activities, etc.; to have an idea of the goals and tasks of an operational search in the specified field; have knowledge about objects of operational search.

To identify such facts, it is very important for operational units to cooperate with the State Financial Monitoring Service of Ukraine and obtain factual data from it that may indicate the illegal activities of certain individuals or criminal organizations. For example, according to the data of the State Financial Monitoring, for 9 months of 2023, the State Financial Monitoring sent 870 materials (477 generalized materials and 393 additional generalized materials) to law enforcement agencies, in particular to: Security Service of Ukraine – 264 materials (146 generalized materials and 118 additional generalized materials); National Police of Ukraine – 228 materials (174 generalized materials and 54 additional generalized materials); National Anti-Corruption Bureau of Ukraine – 131 materials (37 generalized materials and 94 additional generalized materials); Bureau of Economic Security of Ukraine – 99 materials (61 generalized materials and 38 additional generalized materials); prosecutor's office – 68 materials (18 generalized materials and 50 additional generalized materials); State Bureau of Investigation – 80

materials (41 generalized materials and 39 additional generalized materials). In the specified materials, the amount of financial transactions that may be related to the legalization of funds and the commission of a criminal offense amounts to 85.3 billion hryvnias (Public Service Financial Monitoring Of Ukraine, 2023).

The materials of the State Financial Monitoring Service usually do not become a reason for the registration of criminal proceedings, because such materials are not a notification about the commission of a criminal offense but are information about possible illegal activity. In accordance with paragraph 4 of the first part of Article 6 of the Law of Ukraine "On operational and investigative activities", the basis for conducting an OSA is the availability of generalized materials of the central executive body that implements state policy in the field of prevention and countermeasures against the legalization (laundering) of proceeds obtained through criminal means, or financing of terrorism, received in accordance with the procedure established by law.

The objects of operational search (sources of factual data) are persons and objects containing certain traces. The object of an operational search among individuals is persons (who think that they are preparing and have committed a crime or are involved in it; who commit illegal actions; who have information that is important for fighting crime; able to systematically provide assistance in fighting crime). Here we can include the management and employees (including former) of the institutional investor, the management and employees of the counterparties of the institutional investor, the communication circle of certain managers and employees who are of operational interest; individual citizens-investors, persons who have a certain risk of illegal behavior, because they were held to certain types of responsibility for committing offenses in the field of investment activity (financial, disciplinary, administrative, criminal).

As for the subjects that are the objects of an operational search, this includes primarily documents that reflect the course of the institutional investor's economic activity, including electronic documents (primary documents, reporting, accounting, financial documents, including payment, financial business contracts), as well as information carriers on which these documents are stored, unofficial documents (notes, notebooks), personal belongings of persons of operational

interest; funds, securities, other valuables or other property that were obtained as a result of illegal activity.

Traces of operational interest include directly the traces of a person of operational interest and traces of his illegal activities (usually these are electronic traces that remain in the banking system or in the electronic system of an institutional investor), traces on documents (traces of material and intellectual forgery of documents).

The next stage of an operational search is to recognize the signs of a crime. Comparison of detected search objects with search features of objects of operational interest. This stage of operational search is always subjective in nature because it depends on the operational worker who perceives the search objects found because of operational search.

The analysis of the received information involves searching the found objects for signs of a criminal offense in the field of activity of the institutional investor. Here, first, a search is made for factual data that may indicate the commission of a criminal offense, in particular, the following are studied:

- features of tools for attracting assets from individual investors for the purpose of detecting suspicious transactions: the promise of unreasonably inflated income from investments, the attraction of supposedly satisfied investors to the advertising of an institutional investor, demonstrative advertising raffles and various incentives for investing funds, a very limited time for making an investment decision "tomorrow % will be much lower, you can invest money only today" etc.;
- studying the peculiarities of investing the funds involved: studying the areas of investment and business reputation and the peculiarities of cooperation with counterparties, studying the reality of operations (detecting signs of fictitious withdrawal operations under the guise of investing in companies with a dubious reputation or related companies), studying the criteria for selecting counterparties in order to identify atypical counterparties and suspicious transactions; studying the experience of previous deals with counterparties. Search signs can be the inconsistency of the business activity of the counterparty with the publicly stated investment goals, the fictitiousness of the

counterparty's activity, the newly created counterparty and the lack of information about its business reputation, the counterparty's financial problems, the delay in the implementation of investment projects that were started earlier, the lack of clear information about the purpose of the investment, expected profit and guarantees of fulfillment of obligations, the presence in business documentation of objections of officials regarding the allocation of funds within the limits of a certain contract, the conclusion of contracts with only one counterparty; overestimated cost of certain works or services;

- study of data and documents of financial and economic activity: accounting, financial (including bank payment documents); documents on the placement of securities, documents on investment in certain projects, documents that would indicate the inappropriate spending of investors' funds (overpriced advertising, unreasonable costs for providing consulting assistance in a certain area, purchase of goods or services that are not typical for the activities of an institutional investor, etc.). Search signs can include frequent current repairs, unjustified capital repairs, purchase of expensive equipment or computer equipment, detection of inconsistencies between financial and primary documents, detection of signs of non-marketability of financial transactions, tax fraud ("optimization" of tax obligations), the presence of dubious payment documents that did not meet the general purpose of the activity, inconsistency between the content and form of individual documents, signs of material or ideal (intellectual) forgery of documents;
- analyzes materials of audits by supervisory bodies, materials of the State Financial Monitoring of Payments, information on the implementation of supervisory activities in relation to institutional investors in order to identify gaps and "weak" places in security or in other sectors of the institutional investor's activity;
- reveals unprofessional connections of certain employees of the institutional investor with counterparties, employees of regulatory bodies, etc.;
- reveals the "risky behavior" of certain persons (employees of the institutional investor or its "suspicious" counterparties): negligent performance of official duties, taking possession of the institutional investor's funds, communication with a certain criminal environment, the presence

of significant debts or other problems (alcoholism, drug addiction, gambling addiction), which negatively affect the conscientious performance of official duties by them; an unmotivated payment of a bonus or a significant difference in the salary of certain employees may indicate the loyal attitude of the institutional investor's management to certain persons and their connection with illegal activities, the imposition of disciplinary sanctions on certain employees.

Examining documents regarding abuses by officials of an institutional investor must be done with the utmost care (encrypted or through cooperation with trusted employees of the institutional investor) so that the officials do not learn about the audit and do not destroy evidence against themselves, do not bias potential witnesses to false testimony.

The information discovered during the operational search must be properly documented. Documentation forms the basis of proof. During the proof, documentation performs the function of recording information in procedural documents, which are then used in proof in criminal proceedings. Documentation in the OSA is not only intended for recording the information obtained because of the implementation of the OSA. It provides for the process of collecting documented information regulated by departmental regulations, its verification, assessment and use in solving the tasks of the OSA, and in criminal proceedings - in accordance with the procedure established by the Code of Criminal Procedure.

## Conclusions

The activity of institutional investors is a significant part of the state's economy, and therefore illegal encroachments on their activity harm, including, the economic security of the state, as they undermine citizens' trust in financial instruments and the state's ability to protect the public interest.

Crimes in the sphere of activity of institutional investors are of a very high latent nature, therefore, it is precisely the operative and investigative countermeasures against this category of criminal offenses that are effective. In the structure of operational and investigative countermeasures against crimes in the field of activity of institutional investors, we distinguish prevention, detection, and documentation of criminal offenses. In the article, the authors

analyzed the methods, means, and capabilities of operational units in each of the directions of countermeasures.

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## Integrating smart city and smart citizen into the digital economy

### Интеграция умного города и умного горожанина в цифровую экономику

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#### Abstract

The study aims to enhance interactions within smart city infrastructures by systematically analyzing associated challenges and proposing strategic solutions. Employing methodologies such as system analysis, synthesis, optimization, modeling, and decision-making—while considering process uncertainties—we dissect the "smart city" and "smart city dweller" concepts, charting their evolutionary cycles. The results outline a structural framework for interactions between citizens, the state, businesses, and society, integrating key subsystems into a unified infrastructure. We also evaluate feedback mechanisms in urban projects like "Active Citizen" and "Garbage. Not.Net," and investigate smart city self-regulation using the Hurwitz criterion. These insights provide actionable guidance for assessing and advancing smart city projects.

**Keywords:** smart city, citizens, interactions, governance, evolution, infrastructure.

#### Introduction

The digital economy is the result of technological, innovative effects seen in sectors of the economy such as trade, transport, finance, manufacturing, education and health. The consequences of digital transformations are also beyond their information-logical and communication applications. In particular, as in

#### Аннотация

Исследование направлено на улучшение взаимодействия в инфраструктуре "умных городов" путем систематического анализа сопутствующих проблем и предложения стратегических решений. Методология включает системный анализ, синтез, оптимизацию, моделирование и принятие решений с учетом неопределенности процессов. Мы анализируем концепции "умный город" и "житель умного города", отслеживая их эволюционное развитие. Результаты представляют структурную схему взаимодействия граждан, государства, бизнеса и общества, интегрируя ключевые подсистемы в единую инфраструктуру. Также оцениваются механизмы обратной связи в городских проектах, таких как "Активный гражданин" и "Мусор. Нет.Сеть", и исследуется саморегулирование умных городов с использованием критерия Гурвица. Эти выводы предоставляют практические рекомендации для оценки и развития проектов умных городов.

**Ключевые слова:** умный город, горожане, взаимодействия, управление, эволюция, инфраструктура.

the development of the model "smart home", "smart office" and "smart production" to the level of "smart city".

Since the beginning of the pandemic (COVID-19), global demand for digital services has grown by almost a third. Social and network activity has

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also grown: reposts, applications, comments, social and public initiatives, fakes. It is not always positively oriented, especially when it comes to fakes. Anonymity and opacity of actions on the Internet reduces responsibility for extremist actions, fakes, and uncontrolled information flows increase negative consequences in society.

The purpose of the work is a systematic analysis of the forms and categories key to the task of studying the digital activity of citizens in the "smart city" environment and the development of the entire digital society, the capabilities of digital process actors. The main result is the analysis of models of citizens' interactions with society, business and the municipality.

The possibilities of online platforms, strengthening connections and the growth of a variety of such interactions, in particular, crowdfunding platforms, are also analyzed. The political and legal features of supporting the digital activity of Russians are also considered.

### Theoretical foundations

Many studies are devoted to the problems of "digital citizens", their differences from the problems of "non-digital citizens" and civic engagement, in particular (Couldry, 2014; Jones, 2016). The category "digital citizen", firstly, reflects the new infrastructural and legal status of an online user, and secondly, reflects the phenomenon of "Generation Internet 2.0", including a citizen's network protest. We are more interested in the systemic content of the "digital city dweller" category, reflecting the systemic efforts of the city and the authorities.

Most experts consider social media to be an effective environment for:

- 1) informing the public;
- 2) creating and supporting social movements;
- 3) management and decision-making;
- 4) regulation of political life.

Activity (activation) in social networks is a process associated, in particular, with the procedures for posting multimedia, media content. They are important for citizens, society, the entire state (Burkhardt, 2014), as well as for attracting other, potential actors to participate. Activity can start offline, but then be transferred online or vice versa.

All these forms are integrated, forming hybrid forms (Afzalan, 2017), for example, in the field of consumption, production, health care, energy, the development of intellectual and human capital of the world community (Eriashvili, 2021).

Civil participation in networking takes place at various levels, using various platforms and services (digital participation platforms) (Falco, 2018). Including models of interactions such as "crowdfunding" (fundraising for a project) and other models, in particular, based on smartphones (Jones, 2015).

The category "civil participation" is interpreted as both "digital" and traditional ("non-digital") participation. Digital participation is distinguished by cooperation both with other citizens, institutional structures, and with socio-network communities, communications (Smoleva, 2022). All interactions should be aimed at increasing their and leaders (communicators) digital role, for example, comfort of access to digital resources, communication chains and awareness of citizens. This is manifested in the growth of significance and content, the diversity of the structure of the citizen's goals, in particular, his virtualization (Hjerpe, 2018).

Digital civic engagement is implemented by models of interactions: citizens with government (C2G); citizens and society (C2S); citizens and business (C2B) and others (Kaziev, 2017).

Internet functions that stimulate political activity of citizens are:

- 1) mobilization, motivational;
- 2) informational, infological;
- 3) communicative, initiative;
- 4) evolutionary, self-organizational.

Almost digital participation of citizens is carried out by the generation and signing of petitions, charity, digital voting, etc. Systematically and theoretically implemented through the concept of citizenship, based on alternative participation (Akhremenko, 2022).

The degree of civic participation is often determined by the model of active citizenship, the diversity and evolution of civic engagement (Dalton, 2015), and the opportunities for citizens to participate in activating and recognizing democratic change (Youngs, 2019).

Civic activity is not only "digitalized", but also personified. Civic engagement in the digital ecosystem becomes effective even with "weak connections", quickly transformed to a higher level of political activity (Kahne, 2018).

There is also imaginary ("lazy-communicative") activity or the process of mechanical posting of "likes", signatures, etc. Many Internet users are only interested in the possibility of social networking, entertainment and information, but this is not civic engagement (Menteş, 2019).

The transfer of online activities to the surrounding real world can contribute to public significance (Teocharis, 2015), adding a new audience, as happened in various movements or, increasing activity, if a citizen was already involved in the process in the traditional way. Virtual, digital promotions can become more powerful, more representative than their traditional online versions, and online participation can stimulate activity offline (Basheva, 2020).

The work distinguishes between the concepts of "smart" and the SMART paradigm of goal setting and goal achievement. The SMART concept is an acronym for Specific, Measurable, Achievable, Relevant, and Time-bound. Applied to city management - the specificity of goals, measurability of resources, consistency and flexibility of goals, realism and manufacturability, controllability and manageability of urban infrastructure.

### Methodology

Online actors can use the following approaches, methods and operations:

- 1) change the profile in support of a specific initiative;
- 2) arrange hashtags;
- 3) form and maintain petitions;
- 4) launch sites or disable access to them;
- 5) retweets;
- 6) organize groups in social networks;
- 7) post on social networks, etc.

Used Internet services (sites) are supported with helping:

- 1) volunteers;
- 2) "complaints" (public web receptions);
- 3) collecting public funds (crowdfunding platforms);
- 4) collection of open data;

- 5) geo-coordination (web maps, guidebooks, etc.);
- 6) "civic entertainment" (libraries, video clips, audio on civic topics, etc).

A method of correlation and regression analysis is needed between the search for information in social networks and the accompanying political participation, between the developments of civil social network platforms. For example, it is necessary to use cognitive maps and GIS to combat landfills, as it is implemented by the social movement in Russia "Garbage.Not.Net".

The study also uses systems analysis and synthesis methods. Methods and platforms of relevant digital discourse, increasing digital, media literacy, in particular, social forecasting and situational modeling, are used.

Using these methods and Big Data (Data Mining), the necessary decision-making methods and procedures are organized and activated. It is also important to consider the "curse of dimension" in an effective and powerful, distributed mobilization of new opportunities and forms of civic engagement.

### Results and Discussion

For effective, and most importantly, effective influence on the citizens of the "smart city", you need hybrid functionality, the transition from online participation to offline participation, and vice versa. At the same time, we assume that "massive" socio-political activity can be "passive", without real actions in the group.

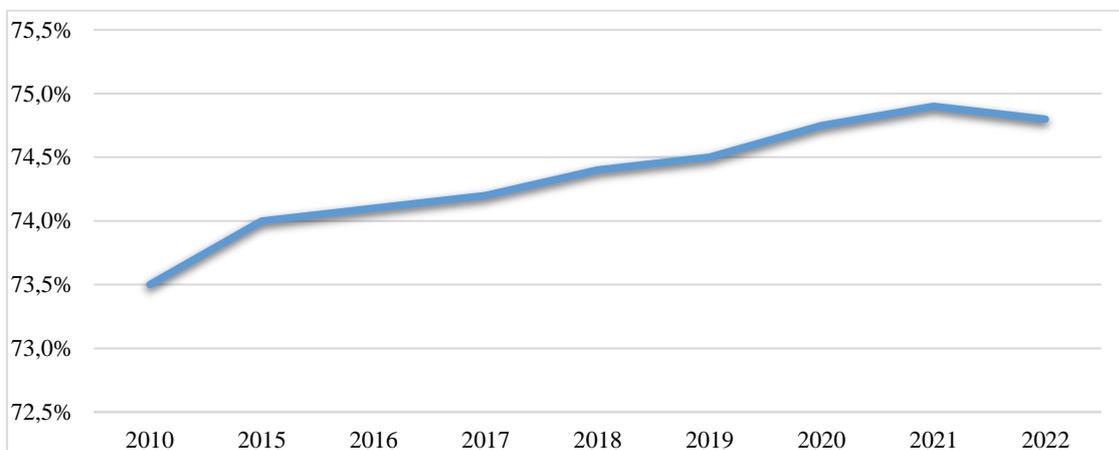
Internet activity contributes to awareness, improvement of relevant worldview and even user participation in the event (discussion, statement, etc.). We offer a project such as "Active Citizen" to solve the problems of the city, feedback from citizens in urban issues and surveys, with points exchanged for services and goods.

As a way to increase civic engagement in the infrastructure of a digital, smart city, the following methods and mechanisms are proposed, in particular:

- 1) blockchain (for example, municipal blockchain voting, organization of housing and communal services);
- 2) online network activities of volunteers;
- 3) provision of public services and creative self-realization online;

- 4) reducing the scale and pace, damage to the spread of fakes, inaccurate information;
- 5) testing civil readiness for the safe use of digital environments of the city (digital environment of personal development, competencies, business creation, etc.), etc.

Russian citizens by 2030 predict about 149 million people (Rosstat). Now the dynamics is different (Fig.1, the author's schedule according to Rosstat).



**Fig. 1.** The share of urban population in Russia.

These are drivers of digital innovations, despite the risks of a "smart city" - the growth of the unemployed, a decline in demand, the vulnerability of business processes, etc.

The problem of adaptive manageability of the "smart city" has been investigated. Let's highlight its subsystems:

- 1) "smart municipality";
- 2) "smart infrastructure";
- 3) "smart citizens";
- 4) "smart management (smart management of the municipality)", etc.

For example, a server that receives data from a cloud service analyzes it using Data Mining, GIS, etc., and then reverse regulation is carried out:

- 1) switching traffic lights (by pace, not by expectation);
- 2) GLANASS/GPS and GIS situation display;
- 3) heuristic analysis of situations with redistribution of flows, etc.

Smart city transport (cargo transportation service) and UBI (Usage Based Insurance) insurance for the use of cars creates effective urban transport systems.

The following structure of the Smart City class is proposed (Fig. 2).

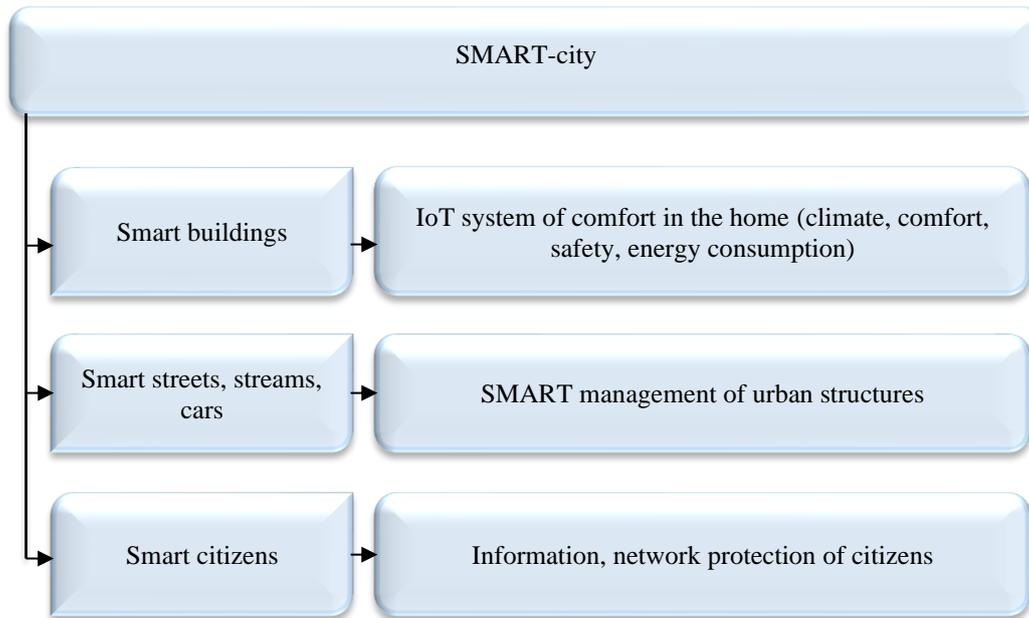


Fig. 2. SMART-city stages and tasks.

Note the features of the "smart city":

- 1) extensive, digital and intelligent infrastructure;
- 2) digital mobility and flexibility of citizens;
- 3) intelligent management and decision-making;
- 4) interactive feedback from city structures and citizens;
- 5) openness of city authorities;
- 6) developed logistics;
- 7) integrated distributed security system, etc.

"Smart City" dialectically, spirally develops, like everyone else, cyclically.

Note the following development cycles:

- 1) new structural methods in the old infrastructure;
- 2) new methods in infrastructure development;
- 3) new consumer preferences of citizens;
- 4) new investment and other attractiveness of the city;
- 5) a new level of competitiveness of the city.

The evolution of the "smart city" requires systemic integration of resources and analytics, decision-making in the face of multi-criteria and uncertainty. To reduce "noise", various approaches can be used, criteria, for example, Hurwitz, Pareto, etc.

Here is an example of using the Hurwitz criterion to assess the evolutionary potential of a smart city:

$$G_i = \gamma \min_{1 \leq j \leq n} \{a_{ij}\} + (1 - \gamma) \max_{1 \leq j \leq n} \{a_{ij}\},$$

where  $0 \leq \gamma \leq 1$  is a parameter (we find from statistics).

Optimal (according to Hurwitz) strategy (maximum among  $G_i$ ):

$$g = \max_{1 \leq i \leq m} \left\{ \gamma \min_{1 \leq j \leq n} \{a_{ij}\} + (1 - \gamma) \max_{1 \leq j \leq n} \{a_{ij}\} \right\}.$$

Test situation. For the winning matrix of various options for the development of a "smart city" of the form:

$$A = \begin{vmatrix} 38 & 36 & 32 \\ 32 & 42 & 45 \\ 27 & 35 & 45 \end{vmatrix},$$

with  $\gamma = 0.5$  (neutrality) we get efficiency  $g = 38.5$ , with  $\gamma = 0$  (optimism), we get  $g = 45$ , and with a pessimistic approach ( $\gamma = 1$ ), we get  $g = 32$ .

The resulting metric integrates errors and risks.

Smart cities are designed and built in various countries: Zurich, Singapore, Oslo, Geneva, Copenhagen, New York, Tokyo, Shanghai, Amsterdam, Barcelona, etc. In Russia, more than 240 projects of "smart cities" are being developed (Ismagilova, 2019) (Moscow, Dubna, Krasnoyarsk, Samara, Nizhny Novgorod, Perm, Voronezh, St. Petersburg, Novosibirsk, etc.).

Some countries are taking measures to regulate Internet communications and online activity. The prospects for the participation of "digital citizens" in public administration and social development are growing as digital transformations in society and e-government evolve.

The digital environment, ecosystem contributes to the mobilization of citizens according to the degree of participation in socially significant projects and through various channels of cooperation.

The construction of the digital infrastructure of the municipality, the digital environment of citizens does not guarantee digital democracy yet. We need systemic efforts of the authorities, business, and society. Therefore, we need systematic research in this direction.

### Conclusions

This study has demonstrated that the effective integration of smart cities and smart citizens into the digital economy requires a systematic and multidimensional approach. The analysis conducted has allowed for the identification of associated challenges and the proposal of strategic solutions to address them.

One of the main contributions of this work is the development of a structural framework for interactions between citizens, state, businesses, and society in the context of smart cities. This framework suggests that the integration of key subsystems into a unified infrastructure is crucial for the success of these initiatives. Furthermore, the importance of feedback mechanisms in urban projects such as "Active Citizen" and "Garbage.No.Net" has been highlighted, as they promote citizen participation and contribute to more efficient management of smart cities.

The study has also explored the potential of mathematical and decision-making approaches, such as the Hurwitz criterion, to investigate the self-regulation of smart cities. These approaches can help optimize the functioning of these cities and adapt to changing needs. Additionally, a class structure for the "Smart City" has been proposed, and its development cycles have been analyzed, providing a solid foundation for understanding and managing the evolution of these initiatives.

To foster citizen participation in the infrastructure of a digital and smart city, various promising methods and mechanisms have been

identified, such as the use of blockchain, online volunteer activities, and the provision of digital public services. However, the study also acknowledges that the construction of digital infrastructures and environments alone does not guarantee true digital democracy. Systemic and coordinated efforts by authorities, businesses, and society are required to achieve this goal.

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## Unlocking success: strategic approaches to enhancing communicative competence in English learning

### Відкриваємо секрет успіху: стратегії підвищення комунікативної компетентності в навчанні англійської мови

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#### Abstract

This article explores the multifaceted nature of communicative competence, discuss its key components, and examine strategies for developing and enhancing this vital skill based on the survey conducted among English language learners. Through a deeper understanding of communicative competence, learners can unlock the full potential of their language abilities and navigate the complexities of our interconnected world with confidence and proficiency. The analysis of an online survey among first-year students provides insights into gender distribution, English proficiency levels, communication skills, and cultural awareness. A significant gender disparity is evident, with females comprising 83% of participants. Regarding English proficiency, the majority perceive themselves as intermediate, with smaller proportions identifying as pre-intermediate, beginner, or advanced. While confidence in overall communication skills is high, specific challenges exist in grammar,

#### Анотація

У даній статті досліджується багатогранна природа комунікативної компетентності, обговорюються її ключові компоненти, а також розглядаються стратегії розвитку та вдосконалення цієї життєво важливої навички на основі опитування, проведеного серед тих, хто вивчає англійську мову. Завдяки глибшому розумінню комунікативної компетентності студенти можуть розкрити весь потенціал своїх мовних здібностей і впевнено та кваліфіковано орієнтуватися у складнощах нашого взаємопов'язаного світу. Аналіз онлайн-опитування серед студентів-першокурсників дає уявлення про гендерний розподіл, рівні володіння англійською мовою, комунікативні навички та культурну обізнаність. Очевидною є значна гендерна диспропорція: представниці прекрасної статі складають 83% учасників. Щодо рівня володіння англійською мовою, то більшість вважає себе на середньому рівні, менша частка – на попередньому, початковому або просунутому. Хоча впевненість у загальних

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speaking, and writing. Limited engagement in English conversations outside formal settings indicates a need for increased practice opportunities. Various strategies are employed to enhance English skills, including media consumption and interaction with native speakers. These findings underscore the importance of tailored support for learners at different proficiency levels, promoting increased engagement in English practice outside the classroom, and integrating cultural sensitivity training to enhance communication skills and intercultural competence.

**Keywords:** communication skills, communicative competence, effective communication, language teaching, online survey participants.

## Introduction

In the contemporary global landscape, characterized by the ever-evolving dynamics of globalization and international collaboration, the acquisition of proficiency in foreign languages stands as a pivotal determinant of success. Among these languages, English emerges as the predominant lingua franca facilitating communication across borders, disciplines, and cultures. Various societies possess unique sets of standards and principles that shape how communication occurs. These cultural standards play a pivotal role in determining the selection of verbal actions, the level of explicitness or subtlety employed, the application of courteous tactics, and the understanding of significance (Bernadette, 2017; Kádár & Zhang, 2019). Despite the recognized importance of English, numerous studies reveal significant deficiencies in the development of communicative competence among learners worldwide. For instance, a 2020 report by the British Council Collen (2020) found that less than 50% of non-native English speakers demonstrated adequate communicative competence, impacting their academic and professional opportunities. Language serves as an extraordinary instrument, enabling humans to transmit not only information but also their intentions, emotions, and social interactions (Al-Athwary, 2022; Xiao & Lee, 2022). However, achieving fluency transcends mere acquaintance with grammatical structures and vocabulary. It encompasses a broader spectrum of language skills encapsulated within communicative competence. This entails

комунікативних навичках є високою, існують певні проблеми з граматиною, говорінням та письмом. Обмежена участь у розмовах англійською мовою за межами офіційних установ вказує на необхідність збільшення можливостей для практики. Для покращення навичок англійської мови застосовуються різні стратегії, зокрема використання засобів масової інформації та спілкування з носіями мови. Ці висновки підкреслюють важливість індивідуальної підтримки студентів на різних рівнях володіння мовою, сприяння більш активному залученню до практики англійської мови за межами аудиторії та інтеграції тренінгів з культурної чутливості для покращення комунікативних навичок та міжкультурної компетентності.

**Ключові слова:** комунікативні навички, комунікативна компетентність, ефективна комунікація, викладання мови, учасники онлайн-опитування.

the adept articulation of ideas with clarity and confidence in oral expression, the adept comprehension of spoken discourse in native-like contexts, encompassing subtle nuances and intricate details, and the adept interpretation of texts spanning varying levels of complexity, discerning both primary and ancillary themes. Furthermore, effective writing entails the production of clear, concise prose adhering to grammatical conventions and stylistic norms. The consequences of insufficient communicative competence are far-reaching, affecting not only individual career prospects but also broader economic and social integration. Therefore, investigating this area is critical. This study aims to address the current gaps in communicative competence by exploring effective teaching methodologies and providing concrete recommendations for educators. By enhancing communicative competence, we can better prepare learners for the demands of the globalized world, thereby contributing to their personal and professional success. Consequently, communicative competence serves as the cornerstone of language proficiency, encompassing a multifaceted array of skills essential for effective communication in diverse contexts. This study not only highlights the existing deficiencies but also underscores the importance of targeted interventions to improve communicative competence, thereby justifying the need for this research.

## Literature Review

Previous research has thoroughly investigated gender differences in academic settings. Psaki et al. (2018) noted that in various low- and middle-income countries, girls' education is advancing, yet gender disparities in educational participation persist, with females frequently outnumbering males. This pattern is reflected in the findings of this study, which observed a significant gender disparity among first-year students. Moreover, Mott (2022) in her report emphasized the multifaceted nature of gender disparities, attributing them to a complex interplay of sociocultural factors. Her mixed-methods research combined quantitative surveys with qualitative interviews, providing a comprehensive view of the issue. However, Mott acknowledged that further research is needed to explore interventions that can effectively mitigate these disparities. The current study's observation of a significant gender gap among first-year students aligns with these previous findings, indicating a persistent imbalance in educational representation.

Understanding students' perceptions of their English proficiency levels is crucial for effective language instruction. Khadigeh (2020) conducted a survey-based study involving 500 non-native English speakers, highlighting the importance of tailored language programs to accommodate learners at different proficiency levels. This study's recommendations, which include differentiated instruction and personalized learning plans, resonate with the current study's analysis. Khadigeh's work, while insightful, was limited by self-reported data, which may not accurately reflect actual proficiency levels. Additionally, Smith et al. (2019) underscored the role of diverse language learning strategies, including exposure to authentic materials and interaction with native speakers, in enhancing language proficiency. The findings regarding students' varied approaches to improving their English skills resonate with these existing studies, emphasizing the need for a multifaceted approach to language instruction.

Effective communication in English extends beyond linguistic proficiency to encompass cultural awareness and sensitivity. Tsang (2022) emphasized the significance of cultural competence in fostering successful cross-cultural communication, a theme echoed in the current study's findings regarding the importance of cultural awareness for effective communication. Her ethnographic study involved international students in a multicultural setting, revealing that

those with higher cultural awareness had better communication outcomes. Tsang's findings support the current study's emphasis on cultural awareness, though her research was limited by its small sample size. Furthermore, Johnson W. & Johnson T. (2018) highlighted the role of language practice outside formal settings in enhancing communication skills, aligning with the current study's recommendations to encourage more frequent English conversations among students. Johnson W. and Johnson T. pointed out the need for institutional support to facilitate such practices, noting a gap in extracurricular language learning opportunities. Overall, the literature supports the importance of addressing both linguistic and cultural dimensions in language learning to promote effective communication in English.

The European Union Department developed the 'Common European Framework of Reference for Languages' (CEFR), which outlines language competences demonstrated through activities and actions related to generating and perceiving texts, linked to specific communication topics and areas, and using appropriate strategies (Council of Europe, 2001). The CEFR underscores the importance of developing communicative competence to solve communication problems in various conditions, an idea supported by Bondarchuk (2023). Celce-Murcia (2007) rethought the role of communicative competence in language teaching, emphasizing its importance in real-world communication contexts. Her work aligns with the current study's focus on practical language use and cultural awareness. Furthermore, the development of intercultural communicative competence in teaching English, as explored by Dvorianchykova et al. (2022), emphasizes the integration of cultural elements in language instruction, which is crucial for fostering effective communication in multicultural environments. Hult & Johnson (2017) provided a practical guide on research methods in language policy and planning, highlighting the importance of robust methodological approaches in studying language education. Their insights underscore the necessity of combining quantitative and qualitative methods, as done in the current study, to capture the complexity of language learning processes.

Evans et al. (2021) explored the impact of migration on educational outcomes, noting that gender dynamics play a crucial role in the adaptation and success of migrant students. Their study, published in the *IZA Journal of Development and Migration*, used a cross-

sectional analysis to examine how educational participation rates among migrants differ by gender. The findings suggest that while female migrants often achieve higher educational outcomes, they face unique challenges that require targeted support measures. This adds a layer of complexity to understanding gender disparities in education and supports the need for comprehensive strategies to address these issues.

Kate Whiting (2020) in her article for the World Economic Forum identified the top job skills of the future, emphasizing the importance of complex problem-solving, critical thinking, and creativity. Whiting's analysis indicates that language proficiency, particularly in English, is integral to these skills, as effective communication is a cornerstone of global collaboration and innovation. This aligns with the current study's emphasis on enhancing communicative competence to prepare students for future job markets. Wilson & Sabee (2003) explicated the theoretical term "communicative competence" in their comprehensive review, highlighting its various components including linguistic, sociolinguistic, and pragmatic competencies. Their work, presented in the "Handbook of Communication and Social Interaction Skills," provides a detailed framework for understanding how communicative competence can be developed and assessed. This theoretical foundation supports the current study's approach to integrating diverse instructional strategies to enhance communicative competence among learners.

As per the definition provided in the 2014 Law of Ukraine 'On Higher Education', competence refers to a dynamic combination of knowledge, skills, practical abilities, ways of thinking, professional, ideological, and civic qualities, as well as moral and ethical values. It determines an individual's ability to carry out professional and educational activities successfully and is the outcome of studying at a specific level of higher education (Law of Ukraine 1556-VII, 2014). Additionally, Lightbown and Spada (2013) and Nation and Macalister (2010) provided foundational insights into how languages are learned and the design of language curricula, respectively. Their works support the need for diverse instructional strategies and the integration of both linguistic and cultural competencies in language education.

Despite these insights, gaps remain in the literature regarding the most effective methods to develop communicative competence.

Specifically, there is a need for more empirical research on long-term outcomes of various instructional strategies and the role of digital tools in language learning. Additionally, while cultural competence is acknowledged as crucial, more studies are needed to explore how it can be systematically integrated into language instruction. The current study aims to address these gaps by investigating the development of communicative competence through a combination of traditional and innovative methods, including digital tools and cultural immersion. By providing the results of the online surveys for educators, this research seeks to enhance communicative competence among learners, thereby improving their personal and professional prospects in a globalized world. Reading books, articles, and other texts in English can help improve your understanding of the language and expand your knowledge of different topics. Writing texts in English can help improve your grammar and style. Additionally, using online language resources and apps can provide a variety of ways to practice your language skills. Attending language courses and clubs can be beneficial for socializing with other English language learners and improving language skills.

### Methodology

This study employed an exploratory mixed-methods approach to investigate language learning and acquisition among first-year university students. The research was designed to provide both a broad overview and an in-depth understanding of the subject, combining quantitative and qualitative data to ensure comprehensive findings. The research was exploratory in nature, aiming to uncover patterns and insights that could inform future studies and interventions in language education. Quantitative data was collected to assess various metrics, including gender distribution, English proficiency levels, and the frequency of English conversations among participants. Techniques used for the quantitative analysis included descriptive statistics to summarize the basic features of the data, frequency distributions to determine the number of occurrences of different responses, and correlation analysis to explore potential relationships between different variables such as gender and English proficiency levels. Qualitative data was gathered to explore participants' communication skills, challenges, strategies, and perceptions of cultural awareness through open-ended survey questions. Techniques used for the qualitative analysis included thematic analysis to identify, analyze,

and report patterns (themes) within the data and content analysis to systematically categorize textual information to identify trends and patterns. A mixed analysis approach was employed, combining quantitative assessments with qualitative insights to provide a comprehensive understanding of the research objectives. This integration facilitated a robust exploration of language dynamics, enhancing the validity and reliability of the study findings.

The researchers carried out an exploratory study in four Ukrainian universities using an online survey conceived and developed by a team of researchers. These universities were Taras Shevchenko National University of Kyiv (Kyiv, Ukraine), Kyiv National University of Technologies and Design (Kyiv, Ukraine), National University of “Kyiv-Mohyla Academy” (Kyiv, Ukraine) and Volodymyr Vynnychenko Central Ukrainian State University (Kropyvnytskyi, Ukraine). To gather the information the researchers needed, they developed a web-based questionnaire in Google Forms. The research participants were 95 first-year students, selected based on their enrolment in these universities.

The sample consisted of first-year students, chosen to provide a representative sample of the population under study. Participants were selected using a purposive sampling method, ensuring a diverse representation in terms of gender and academic background. To ensure the validity and reliability of the data, the following measures were taken: the questionnaire was pilot-tested with a small group of students to refine the questions for clarity and relevance; consistent procedures were followed in administering the survey to all participants; and combining quantitative and qualitative data helped in cross-verifying the findings. Quality control procedures included data cleaning to ensure accuracy and completeness of the data by checking for any inconsistencies or missing responses, and ethical considerations such as

ensuring participant anonymity and confidentiality, and obtaining informed consent from all participants. The steps followed included the development of the questionnaire by a team of researchers, pilot testing and refinement based on feedback, distribution of the online survey to participants via university communication channels, data collection over a specified period, and data analysis using statistical software for quantitative data and qualitative analysis software for open-ended responses. By providing these details, the methodology ensures that other researchers can accurately replicate the study, thereby contributing to the reliability and validity of future research in this area

## Results and Discussion

This section presents the findings of the study, which explored gender distribution, English proficiency levels, communication skills, and cultural awareness among first-year university students in Ukraine. By analysing both quantitative and qualitative data, the study offers a comprehensive overview of the current state of language learning and highlights areas requiring further attention to enhance English language instruction and proficiency.

### A. Gender Data

Figure 1 demonstrates the gender data on online survey participants. The data in Figure 1 below clearly shows that out of 95 students who took part in the online survey, 83% were female and 17% were male. This indicates a significant gender disparity, with females outnumbering males by a considerable margin. Additionally, the point “gender” reflects a minority representation of males, accounting for only 17% of the total population among freshmen. Overall, the characterization of the point “gender” underscores the unequal distribution of genders within the first-year students due to a lot of factors, especially war in Ukraine.

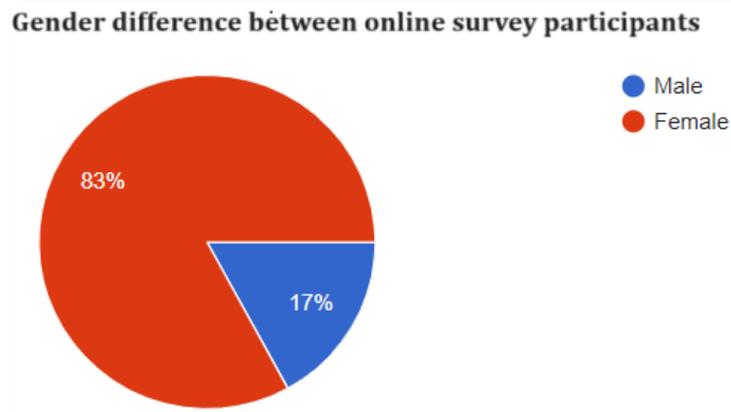


Fig. 1. Gender difference between online survey participants.

B. Current English proficiency level

The analysis of the data reveals that the majority of students, accounting for approximately 69.1%, perceive their current English proficiency level to be at the intermediate stage. This suggests that a significant portion of the surveyed students are comfortable with everyday conversations, possess moderate comprehension skills, and can express themselves with reasonable fluency.

Furthermore, the data indicates that 14.9% of students consider themselves to be at a pre-intermediate level, indicating a slight progression beyond the beginner stage but still with a limited

command of English. Additionally, 10.6% of students identify as beginners, suggesting that they have a basic understanding of the language but may struggle with vocabulary and grammar.

On the other hand, only 5.3% of students perceive themselves to be at an advanced level of English proficiency. This smaller proportion indicates that a minority of surveyed students feel confident in engaging in complex discussions, comprehending nuanced language, and expressing themselves fluently in various contexts.

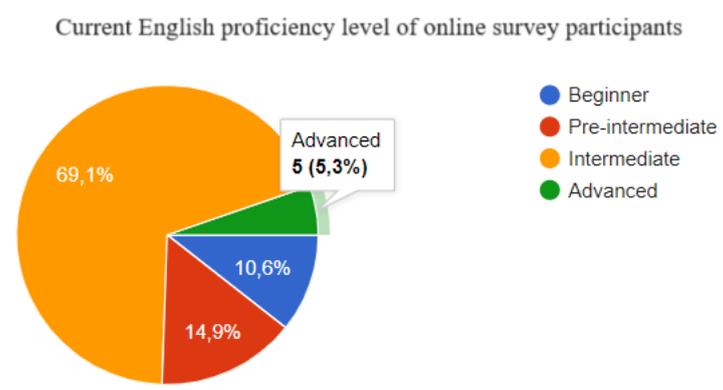


Fig. 2. Current English proficiency level of online survey participants.

The data underscores the importance of recognizing the diverse proficiency levels among English language learners. While a considerable portion of students perceive themselves to be at the intermediate level, indicating a satisfactory command of the language for everyday communication, there remains a significant number at pre-intermediate and beginner levels who may require additional support and resources to progress further.

Furthermore, the relatively small percentage of students identifying as advanced highlights the need for tailored programs and opportunities to challenge and nurture higher-level language skills. Efforts to provide enrichment activities, advanced courses, and opportunities for immersion or authentic language practice could benefit this subgroup of learners.

Overall, understanding the distribution of students across different proficiency levels

allows educators to better address the varied needs and aspirations of learners. By offering a comprehensive and inclusive approach to English language instruction, institutions can empower students to achieve their language learning goals effectively and confidently.

### C. Communication Skills

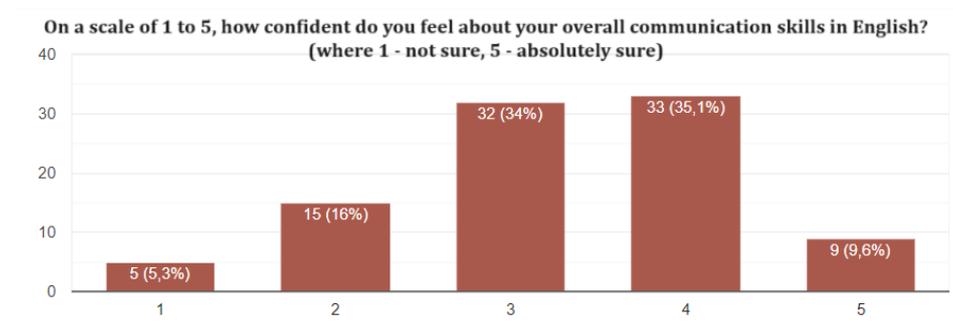
Communication skills encompass various abilities that enable individuals to convey information effectively, both verbally and non-verbally, in diverse contexts and with different audiences. These skills include listening, speaking, writing, and non-verbal communication such as body language and facial expressions. Effective communication is essential in personal, professional, and academic settings, facilitating the exchange of ideas, information, and emotions.

In personal relationships, strong communication skills contribute to building trust, fostering understanding, and resolving conflicts amicably. In the workplace, effective communication is vital for collaboration, teamwork, leadership, and customer relations. Professionals who can articulate their ideas clearly, actively listen to others, and adapt their communication style to

different situations are often more successful in their careers. Moreover, effective communication is crucial for academic success, as it facilitates learning, comprehension, and the expression of ideas in both written and oral forms.

Overall, communication skills play a pivotal role in various aspects of life, influencing social interactions, career advancement, academic achievement, and personal development. Enhancing these skills through training, practice, and self-awareness can lead to improved relationships, greater opportunities, and increased success in both personal and professional domains.

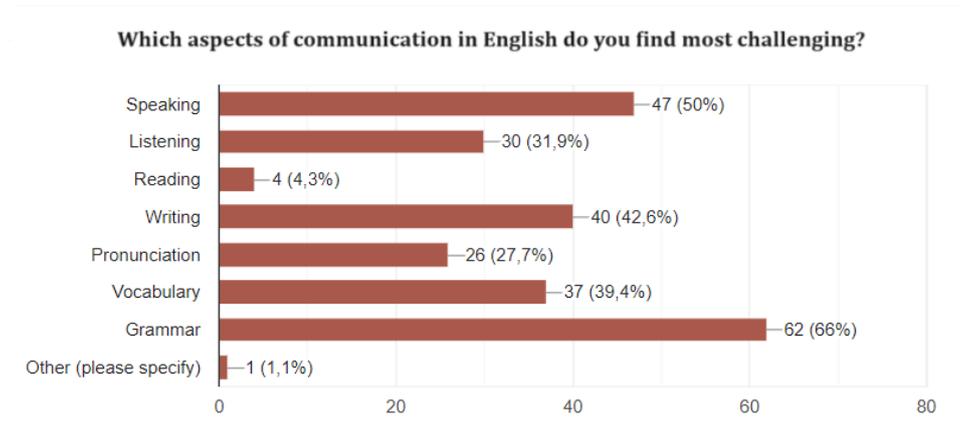
Our survey asked the first-year students to evaluate their overall communication skills in English. The results indicate that the majority of respondents (69.1%) rated their confidence in their overall communication skills in English as a 4, indicating a high level of confidence. Meanwhile, 34% of respondents rated their confidence as a 3, suggesting a moderate level of confidence. Only a small percentage of respondents felt either not confident at all (5.3%) or very confident (9.6%), with 16% of respondents rating their confidence as a 2.



**Fig. 3.** Overall communication skills in English of online survey participants.

These findings suggest that a significant portion of the surveyed individuals possess a relatively high level of confidence in their English communication skills. However, there is also a notable percentage who may feel less assured in

this area. Further analysis could explore factors influencing respondents' confidence levels and identify areas for improvement to support individuals in enhancing their English communication skills.



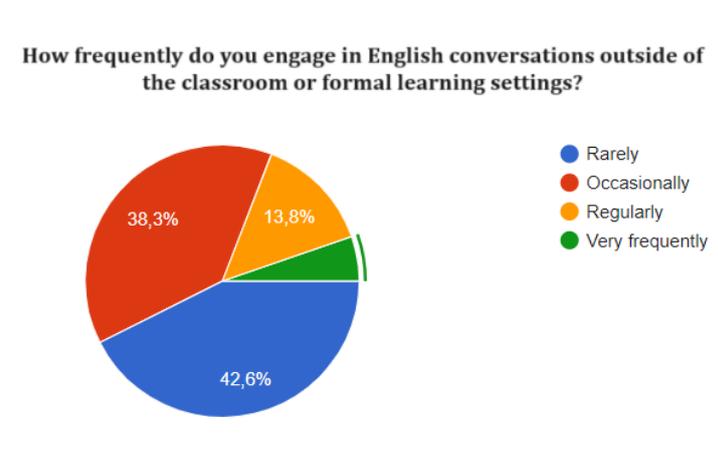
**Fig. 4.** Aspects of communication in English the online survey participants find most challenging.

The survey results reveal that grammar is the aspect of communication in English that respondents find most challenging, with a substantial majority of 66% identifying it as such. Following grammar, speaking and writing are cited as the next most challenging aspects, with 50% and 42.6% of respondents, respectively, indicating difficulty in these areas. Listening and pronunciation are also mentioned by a significant portion of respondents, with 31.9% and 27.7%, respectively, finding these aspects challenging. Additionally, vocabulary poses a challenge for 39.6% of respondents. Interestingly, reading appears to be the least challenging aspect, with only 4.3% of respondents citing it as such.

These findings highlight specific areas where individuals may require additional support or resources to improve their English communication skills. Further analysis could delve into the reasons behind the perceived

challenges and explore strategies for addressing them effectively.

Engaging students in English conversations outside of the classroom or formal learning settings is crucial for their language development. It provides them with real-life opportunities to practice and apply what they have learned in class, thereby reinforcing their language skills and confidence. Encouraging students to converse in English outside of the classroom fosters a more immersive learning experience, helping them to adapt to various communication contexts and interact with native speakers. Additionally, such interactions expose students to diverse accents, colloquial expressions, and cultural nuances, enriching their understanding of the language and enhancing their cultural awareness. Overall, promoting English conversations outside formal settings empowers students to become more fluent, confident, and culturally competent communicators.



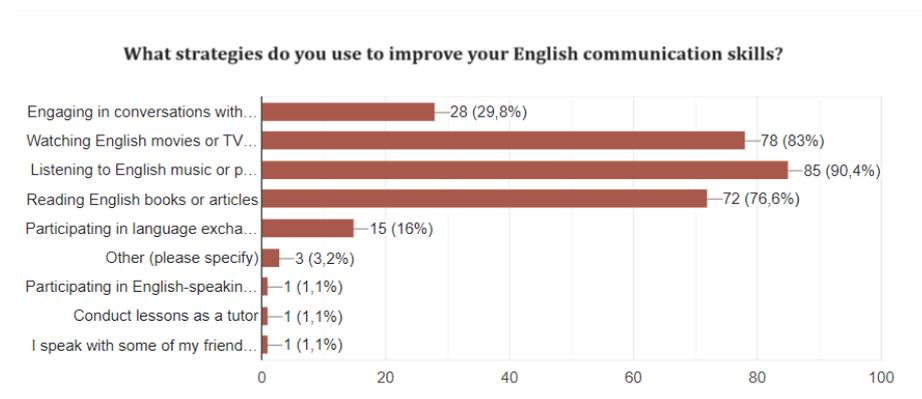
**Fig. 5.** Frequency with which online survey participants engage in English conversations outside of the classroom or formal learning settings.

The survey results indicate that a significant portion of respondents engage in English conversations outside of the classroom or formal learning settings only occasionally, with 38.3% falling into this category. Additionally, 42.6% of respondents reported engaging in such conversations rarely.

On the other hand, a smaller proportion of respondents reported engaging in English conversations more regularly, with 13.8% indicating that they do so regularly and 5.3% stating that they engage in such conversations very frequently.

These findings suggest that there may be limited opportunities for individuals to practice their English communication skills in real-life situations outside of formal learning environments. Encouraging more frequent and regular practice through various means, such as language exchange programs or conversation clubs, could help individuals build confidence and fluency in English.

Exploring effective strategies to enhance English communication skills is vital for language learners seeking proficiency and fluency. In today's interconnected world, where English serves as a global lingua franca, individuals are increasingly motivated to refine their language abilities to engage in diverse personal, academic, and professional contexts. Understanding the varied approaches employed by learners to bolster their communication skills offers valuable insights into effective language acquisition methodologies. From immersive experiences such as conversing with native speakers to utilizing multimedia resources like movies, music, and podcasts, learners employ a range of techniques tailored to their preferences and learning styles. This exploration not only sheds light on the diverse pathways to linguistic mastery but also underscores the importance of adaptability and creativity in the language learning journey.



**Fig. 6.** Strategies the online survey participants use to improve their English communication skills.

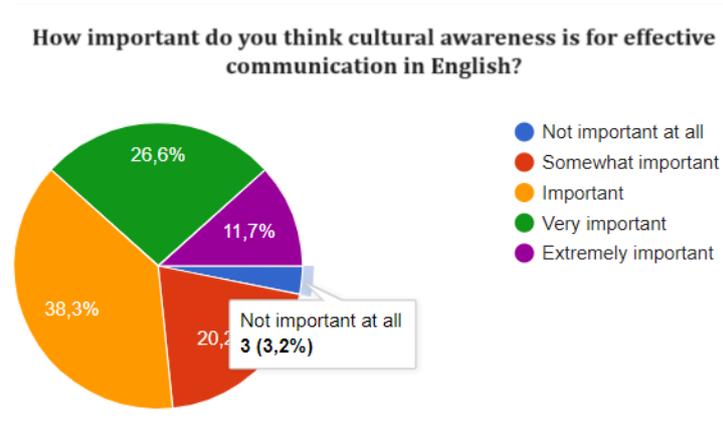
The survey results reveal that respondents employ various strategies to enhance their English communication skills. A significant majority of respondents, 90.6%, reported that they listen to English music or podcasts as a method to improve their English proficiency. Additionally, 83% of respondents indicated that they watch English movies or TV shows for language improvement. Furthermore, a considerable proportion of respondents, 76.6%, reported reading English books or articles as a strategy to enhance their communication skills. Engaging in conversations with native speakers was also cited by 29.8% of respondents as a method they use to improve their English.

While fewer respondents mentioned participating in language exchange programs, with only 16% choosing this option, other strategies were also reported. Some respondents mentioned conducting lessons as a tutor, speaking with friends, and participating in English-speaking clubs as

additional methods to enhance their English communication skills.

In general, these findings demonstrate the diverse approaches individuals employ to develop their English proficiency, ranging from passive activities like listening and watching to active engagement through conversation and participation in language exchange programs.

Cultural awareness plays a pivotal role in fostering effective communication in English, transcending mere language proficiency to encompass a deeper understanding of societal norms, customs, and values. In an increasingly interconnected world where individuals from diverse cultural backgrounds interact on a regular basis, the ability to navigate cultural nuances is essential for building rapport, fostering mutual respect, and avoiding misunderstandings. Cultural awareness plays a vital role in promoting intercultural competence and fostering meaningful cross-cultural interactions.



**Fig. 7.** Importance of cultural awareness for effective communication in English according to the online survey participants.

The survey results indicate that respondents generally recognize the significance of cultural awareness for effective communication in English. A substantial proportion of respondents, 38.3%, deemed cultural awareness as important, while 26.6% considered it very important. Additionally, 11.7% of respondents rated cultural awareness as extremely important for effective communication in English.

Only a small percentage of respondents, 3.2%, indicated that cultural awareness is not important at all. Similarly, a minority of respondents, 20.2%, viewed cultural awareness as somewhat important.

These findings underscore the importance of cultural sensitivity and understanding in facilitating successful communication in English, highlighting its role in fostering meaningful interactions and bridging cultural divides. The findings align with previous studies that emphasize the multifaceted nature of language learning. For instance, Krashen's (1989) Input Hypothesis highlights the importance of comprehensible input in language acquisition, which is reflected in the respondents' use of English media. Similarly, Swain's (1993) Output Hypothesis underscores the role of language production in developing proficiency, evidenced by respondents' engagement in conversations. These connections suggest that learners benefit from a balanced approach that includes both input and output activities.

Moreover, the survey reveals that while many respondents engage in English conversations outside formal learning settings, there is still room for increased frequency in such interactions, which could further enhance their proficiency. This finding is consistent with

research by Derwing & Munro (2013), which emphasizes the importance of authentic communication opportunities for language learners to improve fluency and confidence. Providing more opportunities for real-life practice, such as language exchange programs or conversation clubs, can bridge this gap.

Based on the survey results, it is evident that there is a notable emphasis on the importance of communication skills in English among the respondents. Despite facing challenges, such as grammar and vocabulary acquisition, the majority of participants are actively engaged in improving their communication abilities through various means, including watching English media, listening to podcasts, and reading English materials. The survey also highlights the significance of cultural awareness in effective communication, with a considerable portion of respondents acknowledging its importance. This underscores the need for learners to not only develop linguistic proficiency but also to cultivate an understanding of cultural nuances and context.

Moreover, the survey reveals that while many respondents engage in English conversations outside formal learning settings, there is still room for increased frequency in such interactions, which could further enhance their proficiency. Overall, the findings suggest a strong awareness among respondents regarding the importance of communication skills in English and a willingness to actively work towards improving them. Moving forward, continued efforts to address challenges and enhance cultural awareness can contribute to more effective communication in English.

The analysis of the data underscores the importance of recognizing the diverse proficiency levels among English language learners, with a significant portion of students perceiving themselves at the intermediate level. However, there remains a notable number at pre-intermediate and beginner levels who may require additional support and resources to progress further. Efforts to provide tailored programs and opportunities for advanced learners are essential, as indicated by the relatively small percentage of students identifying as advanced. Enrichment activities, advanced courses, and opportunities for immersion or authentic language practice could benefit this subgroup of learners. These findings echo the principles of differentiated instruction (Tomlinson, 2001), which advocate for varied teaching methods to meet the diverse needs of learners.

Overall, understanding the distribution of students across different proficiency levels allows educators to better address the varied needs and aspirations of learners. By offering a comprehensive and inclusive approach to English language instruction, institutions can empower students to achieve their language learning goals effectively and confidently. Moving beyond proficiency levels, effective communication skills in English are crucial for personal, professional, and academic success. While a majority of respondents express confidence in their overall communication skills in English, there are specific areas such as grammar, speaking, and writing where challenges persist. Encouraging students to engage in English conversations outside of formal learning settings is vital for their language development. While a significant portion of respondents already do so occasionally or regularly, there is still room for increased frequency, which could contribute to enhanced proficiency and confidence.

The strategies employed by respondents to improve their English communication skills vary, highlighting the importance of catering to individual preferences and learning styles. From passive activities like listening and watching to active engagement through conversation, learners utilize a diverse range of methods to bolster their proficiency. These strategies align with findings by Oxford (1990), who identified various language learning strategies that contribute to successful language acquisition, including cognitive, metacognitive, and social strategies. Cultural awareness emerges as a critical component of effective communication in

English, with respondents recognizing its significance in fostering meaningful interactions and bridging cultural divides. Incorporating cultural sensitivity training into language learning programs could further enhance learners' communication skills and intercultural competence, as suggested by Byram (1997). Incorporating cultural sensitivity training into language learning programs could further enhance learners' communication skills and intercultural competence.

Thus, the survey results underscore the importance of communication skills in English and cultural awareness among first-year university students in Ukraine. The findings suggest a strong awareness among respondents regarding the importance of these skills and a willingness to actively work towards improving them. Moving forward, continued efforts to address challenges and enhance cultural awareness can contribute to more effective communication in English.

## Conclusions

The conclusions drawn from the survey underscore a pervasive acknowledgment among participants of the vital significance of effective communication skills in English. Moreover, it reveals an encouraging disposition among respondents to actively engage in endeavors aimed at refining these skills. Recognizing the multifaceted nature of language acquisition, it becomes apparent that continued efforts are imperative to overcome obstacles, foster a deeper understanding of cultural nuances, and provide a spectrum of learning avenues. By addressing these facets comprehensively, the trajectory towards more proficient English communication among language learners can be significantly bolstered. Consequently, initiatives geared towards offering tailored support, promoting cultural sensitivity, and expanding access to diverse learning resources are poised to yield tangible advancements in English language proficiency. This includes implementing enrichment activities, advanced courses, and opportunities for immersion or authentic language practice to cater to various proficiency levels, as well as incorporating cultural sensitivity training into language programs. Ultimately, these endeavours stand to not only enrich individual communication abilities but also contribute to broader societal and intercultural cohesion. By integrating insights from existing literature, such as the theories of Krashen, Swain, and Oxford, educators can develop more effective strategies to support

language learners. Enhanced focus on providing diverse and frequent opportunities for authentic communication, tailored instructional approaches, and cultural sensitivity training can empower learners to achieve greater proficiency and confidence in English. This holistic approach to language education promises to foster more effective and meaningful interactions, both within and beyond the academic environment.

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## Sanctions as a policy tool of Ukraine in countering threats to national security

### Політика санкцій України у протидії загрозам державній безпеці

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#### Abstract

The article analyzes the effectiveness of sanctions as a tool of Ukrainian policy against Russian aggression. It examines the role of the Security Service of Ukraine in identifying individuals and entities subject to sanctions and presenting them to the National Security and Defense Council of Ukraine. The study employs a polymethodological approach, combining philosophical, general scientific, and legal methods. The findings reveal that sanctions are key preventive measures to respond to threats to national security. It concludes that the Security Service of Ukraine plays a fundamental role in the implementation of sanctions and proposes ways to enhance the effectiveness of these restrictive measures.

**Keywords:** sanctions, security, Security Service of Ukraine, state, Ukraine.

#### Анотація

У статті аналізується ефективність санкцій як інструменту української політики проти російської агресії. Розглядається роль Служби безпеки України у процесі виявлення фізичних та юридичних осіб, які підлягають санкціям, та поданні їх до Ради національної безпеки і оборони України.

Результати дослідження свідчать, що санкції є ключовими превентивними заходами для реагування на загрози національній безпеці. На підставі критичного аналізу доходимо висновку, що Служба безпеки України відіграє фундаментальну роль у запровадженні санкцій. При цьому пропонуються шляхи підвищення ефективності вказаних обмежувальних заходів. У дослідженні використовується поліметодологічний підхід, поєднуючи філософські, загальнонаукові та юридичні методи.

**Ключові слова:** безпека, держава, санкції, Служба безпеки України, Україна.

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## Introduction

From the first days of the large-scale military invasion of the aggressor country, one of the key issues to confront the enemies was the application of restrictive measures (sanctions) to entities whose actions pose a threat to national security, support peace and democracy, sovereignty, and territorial integrity of Ukraine, and contribute to the Putin regime in the implementation of illegal intentions to occupy territories of Ukraine.

The sanctions imposed by many countries and world organizations have become one of the decisive tools of influence on the aggressor's behaviour on the global stage. Sanctions are preventive measures which allow to respond swiftly to political challenges and developments that go against its objectives and values of the countries that apply them.

The efficacy of sanctions can be limited in some features. Despite the efforts of states that impose restrictions, the economy of the Russian Federation still runs using alternative ways to solve its problems.

Therefore, the essence of the formation and implementation sanctions as a policy tool of Ukraine against the Russian Federation is sanction duration, the coalition of the initiating states and active monitoring of the effectiveness of restrictions that have already been applied to adapt the sanction policy of our state and partners states consolidations.

Taking into account the fact that the Russian Federation is currently one of the most sanctioned state in the global politics, it should be considered that the imposing sanctions of Ukraine and its allies are not sufficient at this stage and in future needs to be strengthened and be far more effective, in particular, not only forcing restrictive measures, but also ensuring compliance with sanctions regimes, implementing intentions to circumvent them and in bringing about the intended results.

In this scientific article, we will analyze sanctions as a policy tool of Ukraine against the aggressor country of the Russian Federation, theoretical prerequisites, and practical experience of increasing the effectiveness of restrictive and coordinated measures, and the role of the Security Service of Ukraine in this policy.

## Literature Review

The analysis in this sphere highlights a special scientific interest in the study of international sanctions as a tool for countering threats to the national security of Ukraine to disrupt Russian aggression. In particular, O. Kukartsev, O. Motsyk, K. Rashevskaya, and O. Sharov have studied the role of the EU and US sanctions policy in the context of countering Russian aggression in Ukraine by putting pressure on military and political leadership of the aggressor state, as well as bringing it to justice for aggression against democratic countries (Kukartsev, 2023; Motsyk, 2020; Rashevskaya, 2020; Sharov, 2016).

The analysis of the Russian economy risks and the dynamics of its economic development under the USA, European and Western countries that support severe sanctions is in the scope of scientific research has been discussed by A. Bykov, A. Gryshchenko and O. Cherkasets (Bykova, 2018; Hryshchenko, 2017; Cherkasets, 2022).

Horbulin V.P. and Bershed E.R. have studied the sanctions policy of Ukraine in synergistic relationship with its priority of forming and implementing the project of building a democratic society in a large European post-Soviet state, which can become the high-quality example and the model of successful democracy for Russians (Horbulin, & Bershed, 2021).

A. Ivanskyi and Y. Sedlyar have studied the political and financial-legal approaches of the implementation of international sanctions, their theoretical basis, legal nature, and characteristics at the monographic level (Ivanskyi, 2019; Sedliar, 2013).

S. Erlanger and I. Osypchuk have studied the approach of Russia's circumvention of international restrictive measures and its nuclear blackmail of democratic countries in order to mitigate sanctions (Osypchuk, 2022; Erlanger, 2022).

It should be noted that the great attention is paid to the subject of the study used by scholars and practitioners, at the same time, and theoretical and applied approaches of increasing the effectiveness of restrictive measures and the role of the Security Service of Ukraine in this policy remain outside the experts' attention.

**This article intends to approach this matter in analyzing sanctions as a policy tool of Ukraine against the aggressor country of Russian Federation, theoretical prerequisites, and**

practical experience for increasing effectiveness of restrictive and coherent measures and the role of the Security Service of Ukraine in this policy.

### Methodology

A poly methodological approach was used for the research. It covers the following groups of methods: general philosophical (dialectical, phenomenological, axiological, hermeneutic, anthropological, synergistic, etc.); general scientific (abstraction, analysis and synthesis, system analysis, etc.); special (questionnaires, content analysis, deontic, etc.); legal (historical-legal, comparative-legal, formal-dogmatic, etc.).

The dialectical thinking study is used to research theoretical and legal approaches through examining sanctions as a tool for countering threats to national security. The synergetic approach is used to understand the essence of the applicable rules to the state sanction policy, to determine its theoretical and legal nature. Research methods of analysis, synthesis, induction, and deduction are used in the essence of sanctions policy as a phenomenon of ensuring the national security of Ukraine and to define its concept and systematize sanctions tools in countering threats to national security.

The method of analogies is used to conclude the principles of applying sanctions to entities that support and implement the armed aggression of the Russian Federation against Ukraine. By means of the praxeological approach, the concept of the sanctions policy of Ukraine as a tool of restrictive measures of unilateral or multilateral nature is highlighted. These measures targeted at protecting sovereignty, territorial integrity, and the rule of law of Ukraine in repelling Russian armed aggression.

During the study, the law enforcement practice of the Security Service of Ukraine regarding special economic and other sanctions (restrictive measures) and their implementation in the conditions of Russian armed aggression against Ukraine was analyzed.

### Results and Discussion

Sanctions as a policy tool of Ukraine is a tool of unilateral or multilateral sanctions aimed at protecting sovereignty, territorial integrity, and the rule of law, repelling armed aggression against Ukraine, guaranteeing economic and information security, countering terrorism, protecting national interests, and observance of

international human rights obligations by foreign states (Law of Ukraine No. 5191, 2021).

Since the full-scale invasion a number of measures (as of 01.08.2023) to impose sanctions on 11,982 entities (3 individual entrepreneurs, 6,670 individuals and 5,309 legal entities) who supported Russian armed aggression against Ukraine have been launched by the Security Service of Ukraine to the National Security and Defense Council of Ukraine (hereinafter referred to as NSDC). This cooperation is based on the work between state bodies of Ukraine, such as the Cabinet of Ministers, the National Agency for the Prevention of Corruption, the National Bank and representatives of the Intelligence community, such as the Foreign Intelligence Service, the Ministry of Defense, the Main Intelligence Directorate of the Ministry of Defense, within the framework of the Interagency Working Group on the Implementation of the State Sanctions Policy, enforced by a decree of the President of *Ukraine* under the provision of Cabinet of Ministers.

At present, the authorized sanctions have been imposed against almost 17,200 entities, among them 15,600 entities that are at the initiative of the Security Service of Ukraine (as of February 2024) and the total number of sanctioned entities is almost 90% (National Security and Defense Council of Ukraine, 2024).

Sanctions to individual entrepreneurs, individuals and legal entities have been enacted and applied. President of Ukraine Volodymyr Zelenskyy signed Decree No. 36/2024 'On the Decision of the National Security and Defence Council of Ukraine dated 29 January 2024 'On Approval of the Regulation on the State Register of Sanctions'. The Secretary of the National Security and Defence Council of Ukraine shall be responsible for monitoring the implementation of the decision of the NSDC of Ukraine enacted by this Decree. The Regulation on the State Register of Sanctions defines the procedure for maintaining and accessing the unified State Register of Sanctions, as well as providing information from it (Verkhovna Rada of Ukraine, 2024).

The NSDC of Ukraine has imposed sanctions on entities that:

- develop, produce and supply weapons and military equipment in order to support the armed forces of the Russian Federation; components for electronic equipment; hardware and software complex; software for the Russian military-industrial complex;

- high-tech equipment and military munition used by Russians against Ukraine; facilities of ensuring information security and integrated security systems for the military-industrial complex and law enforcement agencies involved in the supply of dual-use goods and components that are further used by the aggressor state in production and development of military goods and weapons of mass destruction; undertake illegal economic activities, in particular related to ensuring the functioning of the occupied territories in eastern and southern Ukraine, (hereinafter referred to as the TOT of Ukraine);
- are involved in the ‘legitimization’ of the temporary occupied territories of Ukraine by making decisions on the admission to the Russian Federation of the so-called ‘new territories’ seized by armed forces, the formation of new entities of the Russian Federation; participate in the organization and taking so-called ‘referendums on entry’ on the temporarily occupied territories of Zaporizhzhia, Luhansk, Donetsk and Kherson regions, as well as in the Autonomous Republic of Crimea;
  - justify and recognize the armed aggression of the Russian Federation against Ukraine and the annexation of the territories of our state as legitimate; blessing servicemen of the Russian armed forces and members of illegal armed groups controlled and financed by the Russian Federation; participate in mass events in support of Russian military actions against Ukraine; create and disseminate narratives of Russian propaganda aimed at refusing to acknowledge the sovereignty and integrity of Ukraine and the very existence of Ukrainian people as a nation; support ideas of Russian ‘greatness and dominance’ in the global world;
  - are actual participants of mass abduction, illegal deportation and child trafficking from the temporarily occupied territories to the Russian Federation organized by Russian authorities;
  - participate in the political life of the aggressor country, have a significant impact on the media, or the ultimate beneficiaries of business entities holding monopoly positions in the financial, banking, industrial, scientific, technical sectors of the economy, logistics, communications, and there are Russian backbone enterprises of strategic management that provide economic support and long lasting financial assistance

to combat military operations on the territory of Ukraine;

- are involved in the activities of the Russian state corporation ‘Rosatom’, which illegally established control over Europe’s largest nuclear power plant– ‘Zaporizhzhia NPP’;
- are involved in the management and functioning of the so-called ‘private military companies’ that are under the direct supervision of the Ministry of Defense of the Russian Federation and whose members are actively participated in the military aggression against Ukraine;
- own assets on the territory of Ukraine, their profits are used to support military aggression of the Russian Federation;
- participate in making deliberate abuse through the adoption of judgement with deliberate violation of human rights and freedoms guaranteed by international treaties.

In response to the application of these sanctions, the Ministry of Justice of Ukraine sent relevant claims to the High Anti-Corruption Court. They have been approved and determined as an asset recovery process of sanctioned entities to the state.

The assets of Russian oligarchs such as A. Deripaska, A. Rotenberg, M. Shelkov, E. Giner, S. Chemezov, V. Yevtushenkov and former President of Ukraine V. Yanukovich were seized into the state budget, as well as assets worth about 190 billion UAH were seized in criminal proceedings. Moreover, corporate rights and real estate of a number of enterprises, the final beneficial Russian corporations’ owners such as ‘Rosneft’, ‘Gazprom’, ‘Rosatom’, ‘Rusal’, ‘Rostec’, ‘Tatneft’, ‘HMS Group’ were seized into the state budget too.

Sanctions policy of Ukraine is carried out under specific terms and conditions. Unlike almost all sanctions decisions that came into force in Europe after 1945 (with the exception of EU sanctions against Argentina during the war over the Falkland Islands), Ukraine has been implementing a policy of sanctions in terms of its military occupation of the territory. Moreover, Ukraine has been in striking danger in the face of a cruel enemy that possesses nuclear weapons and is a permanent member of the United Nations Security Council (hereinafter referred to as the UN).

Civilian infrastructure and critical infrastructure facilities were damaged as a result of the enemy shelling. The largest number of attacks struck

residential buildings, energy infrastructure facilities, industrial facilities, transport infrastructure, as well as agriculture and animal husbandry (Chernysh et al., 2023). The UN Human Rights Monitoring Mission in Ukraine has initiated criminal cases against humanity and war crimes committed by the Russian Federation in Ukraine. The UN Special Rapporteur on torture and other cruel has stated that the use of torture is the essential part of the Russian state in Ukraine (Gall, 2023).

It is obvious that at present there is a tendency of intensity of war crimes that leads to an excessive burden on the investigative bodies. According to the UN Independent International Commission of Inquiry on Ukraine, such an increase in work would be a challenge for any criminal justice system, even in peacetime.

Ukraine is considering all possible ways of 'non-military' compensation for damages caused by war, however, it is not sufficient and acceptable. The number of suspects in criminal proceedings for war crimes or crimes against humanity that are under law enforcement bodies' control of Ukraine is desperately low. Among the 50,625 cases of international crimes, only 552 offenders were arrested or released on bail. As for criminal cases of violation of the laws and customs of war there are 49,483 cases, among which only 85 are offenders, respectively.

It turns out that neither deterrence of hostile actions nor compensation for damages caused by Russian aggression to legal means developed for peacetime has been out of the question.

The Security Service of Ukraine performs several roles in the sanctions policy:

1. As the key agency for national security, it has the direct authority to submit NSDC of Ukraine proposals for the application, amendment, and cancellation of restrictive measures (sanctions). It should be noted that the vast majority of the submitted proposals were initiated by the Security Service of Ukraine.
2. As an investigative agency, the investigation of war crimes is under its jurisdiction, and in accordance with the Draft Law of Ukraine No. 5191, from 02.03.2021, it has been decided to include the investigation of criminal offenses related to the circumvention of sanctions (Law of Ukraine No. 5191, 2021).
3. As a agency that collects evidence from official sources and provides them to the

countries expanding the alliance to enforce sanctions.

Nevertheless, determining the grounds for the implementation of sanctions, the certain challenges have occurred both at the domestic and international levels.

The sanctions as a policy tool for countering threats to the national security of Ukraine (Kostenko et al., 2021) should be aimed either at changing the behavior of the entity or individual to which it is applied (eliminating, averting, neutralizing threats, etc.), or, if it is impossible to change, it should be aimed at reduction of Russian economic and technological proficiency to conduct the war.

In future, depending on the chosen target, it is obligatory to form the grounds for the application of sanctions; they will be based on the behavior that we are trying to change, correct or limit the ability to participate in it.

Sanctions policy of Ukraine should be based on exercising its inevitable right to self-defense, under Article 51 of the Charter of the United Nations (Statute Organization of the United Nations, s.f).

However, the main initiative of sanctions policy of Ukraine concurs with the initiative of self-defense as a state-victim of aggression: people and integrity protection, enemy defeating, undermining its economic potential, de-occupation of territories and compensation for damages Ukraine is an integral part of military efforts in the global armed conflict during which the Russian Federation commits cruel actions and crimes. This initiative is underlined by the President Volodymyr Zelenskyy in the peace plan for Ukraine that was approved on 23.02.2023 by the resolution of the UN General Assembly (United Nations, 2023).

Taking into account that sanctions are mostly have an individual nature, *their addressee is the Russian federation, and not only a resident or a legal entity*. Sanctions policy of Ukraine should be aimed not only at the behavior of the entity or individual to which the restrictive measures are directly applied, but also at a wider range of individuals and legal entities, and the example of applying sanctions might have a preventive effect. In other words, sanctions themselves still act as a warning to everyone that there will be consequences for those who support Russian aggression.

The imposed restrictive measures (sanctions) against the Russian economy do not have a simultaneous effect, it will be intensifying over time. The application of sanctions enforces their implementation, as well as reduces the risks of circumventing them. The complicity of the effectiveness of trade restrictions on the country is that they can be circumvented technically using 'gray' imports or neutral countries.

Furthermore, let's try to highlight the theoretical and practical basis for increasing the effectiveness of the implementation of restrictive measures against the aggressor country.

*Grounded theory and content analysis for studying international sanctions policy* is discussed in the research of Y. Sedlar 'International Sanctions in World Politics: Theory and Practice' (Sedlar, 2013). However, one of the first fundamental studies that examines the effectiveness of international sanctions policy was the collective monograph of American experts G. Hufbauer, J. S. Wilson. Their analysis submits that the effectiveness of the implementation of international sanctions in achieving their intended foreign policy goals is about 30%, and this effectiveness would even increase if there were risks to provide evaluation of political and economic development of the target country (Hufbauer et al., 1983). In the another research the scholars determine economic sanctions failures that are caused by the influence of the following factors:

- if policy goals do not correspond with foreign sanctions, they should be considered as a critical element of the state foreign policy in the target country;
- if allies distance themselves or there are significant commercial losses within the state, the effectiveness of the sanctions policy is gradually decreased;
- influential allies can be forced by sanctions of the target country and participate as a 'black knight', providing support to the target country as compensation for damages that may be caused by the sanctions policy;
- sanctions effects may cause own countermeasures, forcing to integrate the destination country at the government and commercial levels (Hufbauer et al., 1983).

Since the formal publication in a scholarly journal, the political essence of international relations has been enriched with subject matter studies regarding sanctions policy.

According to Professor R. Nyunhem's research, the key factors that affect the formation of sanctions policy against the target country is its political system. Using the experience of assessing the effectiveness of international sanctions in preventing the proliferation of nuclear weapons by Iran, Libya and North Korea, the scientist urges that sanctions would probably be much more successful if the target regime were at least partially democratically open (Newnham, 2010). D. Drezner supports this idea and considers that the implementation of international sanctions to the democratic countries is much more effective than to target states using authoritarian regimes (Drezner, 1999).

The next key factor that affects the success of sanctions is comprehensive international support. This factor has been highlighted in the studies of G. Gardner, C. Kimbrow, M. Doxey (Gardner & Kimbrough 1990).

According to the scholars' observations who researched effectiveness of geographical factors on the economic sanctions from the Institute for International Economics in Washington, it has been stated that the closer the sanctioning state is to the target country, the more influence it'll have to achieve its foreign policy goals through the implementation of sanctions policy (Hufbauer et al., 1983). As a result, the relationship between places reflects both variables of size and distance. This model to international sanctions policy was later characterized as 'gravitational'. Therefore, the geopolitical support factor for sanctions measures is essential, especially from first order neighborhood. Consideration of the introduction of such an indicator has been justified by the fact that with the involvement of neighboring countries in the implementation of sanctions against the target state, the problem of physical control over its borders will be solved, and, therefore, the required level of monitoring over the implementation of sanctions measures will be ensured.

The results of the Japanese expert M. Miyagawa are based on the idea of international sanctions policy. The researcher has pointed out the general prerequisites that can have a significant impact on the target state, great influence on international trade and insufficient development of the domestic economy; political and trade partners participation in sanctions measures of the target country; limited ability of the target state to change export and import markets; small foreign exchange reserves of the target country (Miyagawa, 1992).

Consequently, on the basis of the methodological synthesis of the theory of implementation of international sanctions and taking into account the studied approaches and models, it can be considered that effectiveness of the implementation of the policy of international sanctions depends on:

- the legal mechanisms of a regulatory framework that sets up principles and regulates the restrictive sanctions against the target state;
- institutional support for the implementation of sanctions measures;
- political consensus in the state implementing the sanctions policy using expediency, basic principles and methods of its implementation; and it ensures the efficiency and application completeness;
- the sanctioning state affects export-import dependence of the target country; and it arises due to previous positive political relations between the sanctioning country and the target country;
- the broad international sanctions support at all stages from the global leading countries of their implementation and the use of a ‘gravitational’ model in the implementation of sanctions policy;
- the presence of an opposition in the target country that supports the state in a political way imposing sanctions and is ready to achieve goals with democratic power transition to the target country (Sedliar, 2013).

The assessment of sanctions effectiveness against the Russian Federation is plausible taking into account its impact on the macroeconomic situation in the aggressor country and on sectoral changes. It can be argued that during 2022-2023 the Russian Federation was able to avoid serious destabilization and still maintains the capacity to finance the war against Ukraine (Vlasenko et al., 2020). However, in the short and long terms perspectives, economic stability in the Russian Federation can be under threat and deterioration due to the destruction of economic cooperation with partner countries that support Ukraine in the war against the Russian Federation.

Partner countries have been actively working at implementation of controversial issues in the sanctions policy, as for Russian evasion and circumvention of restrictive measures in cooperation with Ukraine. The strengthening of the sanctions policy is focused on the transport and energy sectors, the military-industrial complex (hereinafter referred to as the MIC), the

risks of production and export of energy resources and raw materials (Sanctions). As a result of sanctions imposed on Russia for its aggressive war against Ukraine, including sanctions on Russian oil and gas, investment and financing, such measures will lead to a gradual decrease in oil and gas production and exports.

The United States, the EU, Canada and other countries *have imposed* massive and unprecedented *sanctions* against Russia in response to the military aggression against Ukraine. The measures are designed to **weaken Russian economy**, depriving it of advanced technologies and markets and significantly curtailing its capacity to wage war, to stop not only international flights but also domestic flights, to limit cooperation in the space industry. The sanctions ban international flights with the countries that have imposed sanctions, restrict an access to their airports, limit the supply of aircrafts, spare parts and aircraft equipment to the Russian Federation, as well as sanctions to ban insurance, maintenance and repair services for aircraft equipment, export of goods and technologies for the space industry.

Nevertheless, airline companies and importers of the Russian Federation adopted ‘friendly’ countries sanctions solving the problems of lacking aircraft parts. According to the survey, from May 2022 prior to June 2023 Russian airline companies imported spare parts for aircraft industry worth \$1.2 billion through intermediaries in Tajikistan, the United Arab Emirates, Turkey, China and Kyrgyzstan. These countries have not joined Western sanctions against the Russian Federation (Gauthier-Villars & Stolyarov, 2023).

In order to strengthen the sanctions regime in this sphere, any effective control of the supply chain has to begin with the initial sale of an item to a distributor as it becomes increasingly complicated to trace its physical whereabouts and impede any illicit activities post-sale. The tracking system should control the movement of spare parts, equipment from the manufacturer to the customer (an airline company). Sanctions restrictions should be considered, with the provision of guarantees and a cash deposit by the customer of these goods (through an airline company or an intermediary) to ensure the delivery of these goods to their destination.

The sanctions imposed by ‘friendly’ countries have also caused heavy losses to the Russian automobile industry and related sectors of the Russian economy. Therefore, the sanctions

policy of Ukrainian partner countries bans the supply of vehicles that are classified as luxury goods (the EU has set the maximum cost of such cars from 50 thousand euros), as well as components and spare parts for them to the Russian Federation. Moreover, sanctions were imposed against the company KAMAZ PTC, whose products are actively used by the Ministry of Defense of the Russian Federation in the war against Ukraine. Later, in order to limit the industrial potential of the aggressor country, the supply of technologies, components, items and other automobile goods to the Russian Federation was limited with certain exceptions (European Union, 2014).

Instead of integration process in the automobile industry on the global market, the Russian Federation has chosen the way of achieving technological sovereignty and import dependence on China. In the context of sanctions restrictions, it might be to hinder this sector development in Russian economy (European Union, 2014).

The sanctions of partner countries have also affected the metallurgy industry of the Russian Federation. In particular, in the field of metallurgical products, restrictions on their import and transportation to third countries have been imposed, import duties have been increased, and the 'most favored nation' status has been removed. Moreover, sanctions have been applied directly to metallurgical enterprises. Despite the reduction in steel sector and its export abroad, we observe a significant increase in the supply of steel products for the needs of military-industry in Russia.

Refer to the present situation, *Ukraine should focus its efforts on* political and diplomatic arena to strengthen sanctions against the metallurgy industry of the Russian Federation, to create conditions to prevent their circumvention, to replace metal products and ores of Russian producers by products of the Ukrainian mining and metallurgical complex on the EU market.

The collapse of bank capital in Russia was the result of the sanctions imposed by Ukrainian Western partners at the end of February 2022. After a year and a half of cutting Russia's access to capital markets by the EU, experts consider that they have not led the Russian banking sector and key market players to the bankruptcy. Moreover, the Russian banking sector has a strong resilience margin. However, the essential consequence of the imposed sanctions has been Russia's isolation from the international financial

infrastructures. Sanctions have cut Russia off from money transfer channels, the most technologically advanced banking sectors, and have backed Russian banking sector in soviet times (International Security and European Integration of Ukraine, 2022).

The USA government and its allies have also made significant efforts to reduce military industry of the Russian Federation. Firstly, it was aimed at preventing the Russian Military industry from obtaining items, elements, and materials. At present the sanctions of partner countries and Ukraine against the military-industrial complex of the Russian Federation are:

- make a shortage of certain high-quality components and force the Ministry of Defense and military-industrial complex to replace them with low-quality items;
- government attempts to acquire high-end microchips produced by the global leading companies that have attracted significant attention and enhance control from the beginning of the war;
- the sanctions implementations on the engines production will have long-term consequences for the armed forces, primarily in terms of their restoration, repair and technology enhancement, as well as on efforts to sophisticate new military technologies in this sphere, including aircraft building;
- Russia could be facing a shortage of advanced optical systems, this process is leading to tanks reequipment with lower-quality and outdated technologies and additional losses during hostilities;
- Russia could be experiencing a shortage of bearings, that have negativ impact on vehicles production (military and civilian). However, Russia is trying to replace the components shortage with lower-quality items produced in Asia.

## Conclusions

The implemented sanctions against Russia imposed by partner countries and international organizations have positive outcomes and affect the Russian economy and politics. **The sanctions aim to weaken Russia's ability to finance the war** and specifically target the political, military and economic elite responsible for the invasion. Sanctions policy of Ukraine has already led to the reduction in foreign investment, limited access to financial markets, reduced exports and imports of goods, as well as restricted economic and political measures for Russian individuals,

entities, officials and businessmen. However, it should be considered that the effectiveness of sanctions in some spheres against the Russian Federation has been limited yet.

Measures listed below, in particular, insufficient states involvement of the geopolitical environment of the target country in the implementation of international sanctions; an aggressor state autocracy and the absence of the viable opposition in the government that could be politically oriented towards the state imposing sanctions, as well as could demonstrate democratic transition in the power of the target country reduce the effectiveness of the implementation of international sanctions against the Russian Federation.

The key factor to improving the effectiveness of sanctions against the Russian Federation is the duration of sanctions policy implementation, the coalition of the initiating states and current monitoring of the effectiveness of the restrictive measures applied for the viable adaptation of the sanctions policy.

In our opinion, the implementation of a set of measures aimed at strengthening analytical capabilities, internal cooperation, international cooperation, etc., will contribute to increasing the role of the Security Service of Ukraine in the implementation of Ukraine's sanctions policy in countering threats to state security.

Analytical capabilities. Strengthening analytical capabilities will allow employees of the Security Service of Ukraine to identify potential threats more effectively to state security and organize countermeasures.

Internal cooperation. Strengthening cooperation between various services and departments in Ukraine, such as customs, law enforcement agencies, financial institutions, etc., will allow faster and more effective detection and response to sanctions violations.

International cooperation. Cooperation with other countries and international organizations to exchange information and coordinate efforts to implement sanctions will increase their effectiveness.

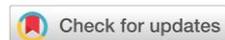
Implementation of technologies. The use of modern technologies such as artificial intelligence, big data analysis and cyber defense will also significantly increase the analytical capabilities and effectiveness of sanctions control.

In general, the combination of these and other measures will allow the Security Service of Ukraine to become more effective in implementing the sanctions policy and ensuring the state security of Ukraine.

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## European legal standards of digitalization of the judiciary

### ЄВРОПЕЙСЬКІ ПРАВОВІ СТАНДАРТИ ДИГІТАЛІЗАЦІЇ СУДОВОЇ ВЛАДИ

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#### Abstract

The article reveals the content of the concept of European legal standards in the area of digitalization of the judiciary adopted as mandatory or as recommendatory typical legal principles and norms fixed (contained) in common sources of law (*acquis communautaire*) of the European legal system. They are the minimum legal requirements for the organization and implementation of e-justice for the EU member states. The application of these standards takes place in the course of their implementation by national laws of both the EU member states and states that are guided by the legal values of the EU and/or seek to acquire EU membership, like Ukraine.

The normative basis, goals and principles of e-justice in the EU are thoroughly analysed. The key positions on the digitalization of the judiciary, which are set out in the EU legal documents containing the relevant legal standards, are defined. Attention is drawn to the fact that the main elements of e-justice, implemented in Ukraine under the influence of

#### Анотація

У статті розкривається зміст поняття «європейські правові стандарти у сфері дигіталізації судової влади (ухвалені як обов'язкові або як рекомендаційні типові правові принципи й норми, зафіксовані (вміщені) у спільних джерелах права (*acquis communautaire*) європейської правової системи, що є мінімальними правовими вимогами щодо організації і здійснення електронного правосуддя для держав-учасниць ЄС). Втілення цих стандартів відбувається в ході їх імплементації національними законодавствами як держав-учасниць ЄС, так і держав, що орієнтуються на правові цінності ЄС та/або прагнуть набути членства в ЄС, як Україна.

У дослідженні використовуються загальнофілософські, загальнонаукові і спеціально-наукові (приватно-наукових) методи пізнання.

Грунтовно проаналізовано нормативну основу, цілі та принципи електронного правосуддя в ЄС. Визначено ключові позиції щодо дигіталізації судової влади, які викладені в

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European standards, can be considered the following: (i) conducting electronic office work, centralized storage of cases and other procedural documents in a single database; (ii) exchange of documents and information; (iii) electronic method of determining a judge (judge-rapporteur) to consider a particular case; (iv) using information and communication technologies to investigate electronic evidence; (v) trial participation in the hearing via videoconference; (vi) adoption and publication of judicial acts in electronic form.

**Keywords:** digitalization, judiciary, e-court, e-justice, rule of law, implementation, legal standards.

## Introduction

Expanding the boundaries of the availability of justice to the population, as well as combining the availability of justice with openness in the activities of the judiciary, overcoming the problem of unjust decisions of the court, increasing the level of public confidence in the court as an institution of state power and reducing the burden on the courts are becoming increasingly obvious, universal and influential factors that encourage different states to take large-scale steps to digitalize the judiciary, considering digitalization almost a panacea in adapting the judiciary to the challenges of the digital age.

Solving complex and multifaceted problems of digitalization of the judiciary is seen as possible and necessary in Ukraine due to such direction of modernization of its organization and activities as implementation of European standards of judiciary digitalization, which gradually acquire the importance of legal standards in connection with the activities of the relevant European institutions in this direction. Moreover, such implementation is not optional, but imperative direction of reforming the judicial system of Ukraine in the direction of its in-depth digitalization in connection with the constitutionally proclaimed in Ukraine strategic course towards European integration (Law of Ukraine No. 2680-VIII, 2019). So, the strategic course of the Ukrainian state to join the European Union requires further development of the judicial system, “taking into account the best

правових документах ЄС, що містять відповідні правові стандарти. Звертається увага на те, що основними елементами електронного правосуддя, імplementованими в Україні під впливом європейських стандартів, можна вважати такі: 1) ведення електронного діловодства, збереження справ і централізоване зберігання процесуальних та інших документів в єдиній базі даних; 2) обмін документами та інформацією; 4) електронний спосіб визначення судді (судді-доповідача) для розгляду конкретної справи; 5) використання ІКТ для дослідження електронних доказів; 6) участь учасників судового процесу у судовому засіданні в режимі відеоконференції; 7) ухвалення та оприлюднення судових актів в електронному вигляді.

**Ключові слова:** дигіталізація, судова влада, електронний суд, електронне правосуддя, верховенство права, імplementація, правові стандарти.

international standards and practices” with the “implementation of international standards and best practices of the Council of Europe and the European Union”. And, therefore, it determines the “development of electronic legal proceedings taking into account world standards in the area of information technology” (Decree of the President of Ukraine No. 231/2021, 2021) to ensure that the Ukrainian judicial system acquires signs of independence, fairness, transparency and efficiency of its functioning.

## Theoretical Framework

The interaction of information and communication technologies (ICT) with the judicial system naturally led to an urgent need for “new legal concepts, standards, procedures, legislative strategies and system design and planning” (Council of the European Union, 1992). It is no coincidence that in European jurisprudence approaches to analysing the actions of the its institutions, aimed at using artificial intelligence in the area of justice in all its potential, are becoming increasingly common (Covelo de Abreu, 2019, p. 3-48; Kengyel, Nemessányi, 2012; Silveira, & Abreu, 2018; Storskrubb, 2017, p. 271-302). And e-justice is positioned not just as a certain set of public services provided by courts to citizens and legal entities in digital format, but as a specific set of legal values that represent, support and implement the judicial authorities in practical interaction with other subjects of law during the

jurisdictional process (Lupo, 2019, p. 77-113). At the same time a kind of consensus has developed in the European scientific literature on the existence of a controversial impact of e-justice on the rights of the parties, as well as on the effectiveness of judicial proceedings (Koshman, 2022, p. 74). Thus, along with the significant advantages of e-justice, there are numerous risks of excessive “digitalization” of the judiciary. It may encroach on the right of everyone to judicial protection, lead to a restriction of citizens’ access to justice as a result of belonging to socially vulnerable segments of the population, digital illiteracy or limiting the availability of new ICT. The technical unpreparedness of courts and judges to implement and use ICT for the administration of justice have risks of disruption of access to courts electronic systems by unauthorized persons. Also it may cause the emergence of numerous other problems: organizational, security and with human rights.

### Methodology

The study of European standards for the digitalization of the judiciary determines the use of a methodology that involves a combination of general-philosophical, general-scientific, and special-scientific methods.

The dialectical method was also used to analyse doctrinal approaches to the definition of the term “European standards of digitalization of the judiciary” as the primary, starting concept in this study.

The general-scientific methods used in this study were methods of analysis and synthesis, as well as a system-structural method. The method of analysis made it possible to fit the digitalization of the judiciary into the pan-European trend of building a digital democracy based on the model of good governance, correlate this digitalization with the requirements of ensuring access to justice, transparency of the judiciary, ensuring the effectiveness of the rule of law in the area of justice. Using the method of synthesis, the authors managed to formulate conclusions about the interdependence of the Ukrainian experience of digitalization of the judiciary from the consideration and application of European standards of such digitalization; to identify the constructive elements of such standards that require implementation in the Ukrainian law-making and law enforcement practice.

The special-scientific methods were formal-legal, hermeneutical, historical-legal and

comparative. In particular, the formal-legal method made it possible to find out the substantive characteristics of European legal standards for the digitalization of the judiciary, the content and orientation of regulatory legal acts in the area of judicial digitalization in Ukraine. The hermeneutical method used in the interpretation of scientific concepts and normative terms from the area of digitalization of the judiciary (e-justice, standards of the judiciary and legal proceedings, standards of digitalization of the judiciary, etc.). The historical-legal method made it possible to show the digitalization of the judiciary as a continuing legal process in real time, which has an unfinished character, structure, features, its own dynamics in Ukraine and in the EU. This process is marked by its own specifics of the emergence and deployment in the current time and space. The use of the comparative method is determined by the specifics of the subject of this research. It involves a large-scale comparison of European legal standards with the relevant legislative efforts in the area of digitalization of the judiciary in Ukraine. This method made it possible to find out the basic, model nature of European legal standards in this area, to prove the relevance of bringing them in line with the rapidly developing Ukrainian legislation on e-justice over the past 10–15 years.

### Results and Discussion

#### *Understanding the essence of European legal standards for the digitalization of the judiciary*

Recently, in Ukrainian jurisprudence, theses on the urgent need for the implementation of European standards of the judicial system and legal proceedings in the judicial system are increasingly being substantiated (Atamanchuk, 2019, p 109-116; Holubieva, Andronov, & But, 2021; Izarova, 2018, p. 55-61). It is also noted that in the process of implementation of European standards in the sphere of procedural and legal regulation of judicial proceedings of Ukraine, it is necessary to take into account the peculiarities of system connections of the Ukrainian procedural legislation, the dynamics of changes in European models of procedural regulation of judicial proceedings (Dehtiar, Pechena, 2022, p. 107). These scientific conclusions reflect the objective needs of the development of the Ukrainian judicial system in organic unity with the key trends and patterns of development of the EU judicial systems.

First of all, European legal standards are minimum legal requirements formulated

sufficiently generally. They act as principles of legal regulation of relevant spheres of public life (Kliuchkovskiy, 2020, p. 37).

European legal standards are a kind of regional international legal standards (Stemkovska, 2021, p. 45-46). They include elements such as the general principles of EU law and EU common values related to human rights, the environment, economic issues, etc. A classic example of their consolidation is the European Convention on Human Rights 1950, where they are formulated as principles (Khaustova, 2016, p. 34).

It is clear that the content of these standards is differentiated depending on the scope of application. In particular, it can be argued about European legal standards in the area of judicial system and legal proceedings. First of all, the scientific literature has formed the following opinion about these standards. They appear as common, typical principles and norms that are fixed in the main sources of law of the European legal system and they are the minimum legal requirements for the judicial systems of the EU member states (Luts, 2004, p. 175). These standards are binding or advisory i.e. correspond to the paradigm of coexistence of “hard” and “soft” law in the EU legal system (Khaustova, 2016, p. 34). Their implementation provides for consolidation in national legislation, development and improvement of the judicial system, taking into account their application in the practice of the judicial authorities of the state (Paskar, 2021, p. 118-121). Starting standards are: (i) an access to justice; (ii) a fair trial covering the right to an adversarial process; the right to equality of parties; the right to be represented in court; the right to oral hearing; the right to fair proof; the right to a reasoned court decision; (iii) a public trial, including a public announcement of the judgment; (iv) a trial within a reasonable time; (v) a trial by an independent and impartial court established on the basis of the law (Izarova, 2015, p. 12).

In the course of the formation and development of e-justice within the EU, a system of certain legal standards for the digitalization of the judiciary has been developed. It is significant both in terms of the further development of e-justice within the EU member states and in the states implementing European integration in order to gain full membership.

It is important that for Ukraine the implementation of European legal standards is not a matter of free discretion of its state institutions, despite the fact that Ukraine is not

formally a member of the EU. Instead, the obligation of such implementation follows both from the point of view of a number of international legal obligations assumed by Ukraine: in accordance with the Association Agreement with the EU, 2014 and constitutional fixation of the strategic state course, 2019, aimed at Ukraine’s full membership in the EU. In addition, their implementation in court proceedings is relevant, since in this way the democratic development of Ukraine and the construction of a rule of law state are ensured (Babenko, 2021, p. 353). It includes a national model of e-justice relevant to European legal experience.

If we analyse the European legal standards in the area of digitalization of the judiciary from the point of view of the ratio of mandatory and recommendation standards, we should take into account that in general the whole system of European standards of the judiciary and the status of judges consists of two groups: (i) generally recognized European standards, i.e. mandatory European standards; (ii) special European standards in the area of the judicial system and the status of judges (advisory standards) (Babenko, 2021, p. 353).

If we analyse the meaningful and formal-legal consolidation of European standards of digitalization of justice, we will come to the following conclusions. Firstly, these standards have a predominantly advisory nature. It follows from the names of the documents where they are contained – conclusions, recommendations, resolutions, etc., as well as directly formulated in the legal documents of the EU institutions, in particular, as “general guidelines” (Council of the European Union, 1995; Council of the European Union, 2001a), “principles and guidelines” (Council of the European Union, 2001b; Council of the European Union, 2003a; Council of the European Union, 2003b), “guidelines” (Council of the European Union, 2001b). Secondly, European standards of digitalization of justice in contrast to the minimum standards of civil procedure in the European Union approved by the Resolution of the European Parliament (2015/2084 (INL) of July 4, 2017 (Council of the European Union, 2018), do not have a single, unified source of consolidation (they are contained in the conclusions of the Consultative Council of European Judges, resolutions of the Parliamentary Assembly of the Council of Europe, the Committee of Ministers, documents of the European Commission for the Efficiency of Justice, as well as in some other acts that laid

the foundations for the formation and development of European policy in this area. Thirdly, the standards tend to combine the definition of the principles of ICT application in judicial activity with the elements of policy planning in the area of digitalization of the judiciary (approved by the European e-justice Strategies and Action Plans 2008 (Council of the European Union, 2008), 2014–2018 (Council of the European Union, 2013), 2019–2023 (Council of the European Union, 2019b), 2009–2013 (Council of the European Union, 2009a), 2014–2018 (Council of the European Union, 2014), 2019–2023 (Council of the European Union, 2019a).

#### *Regulatory framework for e-justice in the EU*

As of today, a number of normative legal acts of the Council of Europe that contribute to the formation of e-justice in the EU have been adopted. They are<sup>5</sup>:

Recommendation No. R (84) 5 of the Committee of Ministers to member states on the principles of civil procedure designed to improve the functioning of justice (adopted by the Committee of Ministers on 28 February 1984 (Council of the European Union, 1984);

Recommendation No. R (92) 15 of the Committee of Ministers to member states concerning training, research and training in the area of law and information technology on 19 October 1992 (Council of the European Union, 1992);

Recommendation No. R (95) 11 of the Committee of Ministers to member states concerning the selection, processing, presentation and archiving of court decisions in legal information retrieval systems (adopted by the Committee of Ministers on 11 September 1995) (Council of the European Union, 1995);

Recommendation Rec (2001)2 of the Committee of Ministers to member states concerning the design and re-design of court systems and legal information in a cost-effective manner (adopted by the Committee of Ministers on 28 February 2001) (Council of the European Union, 2001a);

Recommendation Rec (2001)3 of the Committee of Ministers to member states on the delivery of court and other legal services to the citizen

through the use of new technologies (adopted by the Committee of Ministers on 28 February 2001) (Council of the European Union, 2001b);

Opinion No. 2(2001) of the Consultative Council of European Judges (CCJE) for the attention of the Committee of Ministers of the Council of Europe on the funding and management of courts with reference to the efficiency of the judiciary and to Article 6 of the European Convention on Human Rights on 23 November 2001 (CCJE, 2001);

Recommendation Rec (2003)14 of the Committee of Ministers to member states on the interoperability of information systems in the justice sector (adopted by the Committee of Ministers on 9 September 2003) (Council of the European Union, 2003a);

Recommendation Rec (2003)15 of the Committee of Ministers to member states archiving of electronic documents in the legal sector (adopted by the Committee of Ministers on 9 September 2003) (Council of the European Union, 2003b);

Recommendation CM/Rec (2010)12 of the Committee of Ministers to member states on judges: independence, efficiency and responsibilities (adopted by the Committee of Ministers on 17 November 2010) (Council of the European Union, 2010);

Opinion No. (2011)14 of the CCJE “Justice and information technology (IT)” (on 7–9 November 2011) (CCJE, 2011);

Guidelines on how to drive change towards Cyberjustice of the European Commission for the Efficiency of Justice (CEPEJ) (adopted by CEPEJ on 7 December 2016) (CEPEJ, 2017);

European ethical Charter on the use of Artificial Intelligence in the judicial systems and their environment (adopted by European Commission for the Efficiency of Justice (CEPEJ) on 3–4 December, 2018) (CEPEJ, 2018);

Guidelines of the Committee of Ministers of the Council of Europe on electronic evidence in civil and administrative proceedings (adopted by the Committee of Ministers on 30 January 2019) (Council of the European Union, 2019c);

<sup>5</sup> Below is an approximate, but not complete list of legal documents in the area of digitization of the judiciary issued by the EU institutions. At the same time, we have singled out

documents according to the criterion of their strategic importance for the development of the principles of e-justice in Europe and Ukraine.

Toolkit for supporting the implementation of the Guidelines on how to drive change towards Cyberjustice (adopted by CEPEJ on 13–14 June 2019) (CEPEJ, 2019);

European Commission for the Efficiency of Justice (CEPEJ) Declaration “Lessons Learned and Challenges Faced by the Judiciary During and After the COVID-19 Pandemic” on 10 June 2020 (CEPEJ, 2020);

Council of the European Union Conclusions “Access to justice – seizing of opportunities for digitalization” (adopted on 14 October, 2020) (Council of the European Union, 2020);

Guidelines of the Committee of Ministers of the Council of Europe on online dispute resolution mechanisms in civil and administrative court proceedings (adopted on 16 June 2021) (Council of the European Union, 2021);

Regulation (EU)2022/850 of the European Parliament and of the Council of 30 May 2022 on a computerized system for cross-border electronic exchange of data in the area of judicial cooperation in civil and criminal matters (e-CODEX system) (Council of the European Union, 2022), etc.

A separate group of documents containing legal standards in the area of digitalization of the judiciary are acts of a strategic (both judicial and procedural) nature, namely, European e-justice Strategies and Action Plans approved by the European Commission in 2008 (Council of the European Union, 2008), 2014–2018 (Council of the European Union, 2013), 2019–2023 (Council of the European Union, 2019b), 2009–2013 (Council of the European Union, 2009a), 2014–2018 (Council of the European Union, 2014), and 2019–2023 (Council of the European Union, 2019a).

Without pretending to be exhaustive, we will consider some key positions on the digitalization of the judiciary set out in EU legal documents with relevant legal standards.

In accordance with Appendix I to Recommendation No. R (95) 11 of the Committee of Ministers to member states concerning the selection, processing, presentation and archiving of court decisions in legal information retrieval systems (Council of the European Union, 1995), along with expanding access to justice, it is said about (i) qualitative improvement of the justice system itself by ensuring the unity of judicial practice;

(ii) removing the elements of stiffness, that is, giving it the dynamism and flexibility necessary for the current pace of social and legal development; (iii) expanding the scope of informing society about judicial activities.

In the Appendix to Recommendation Rec (2001)2 of the Committee of Ministers to member states concerning the design and re-design of court systems and legal information in a cost-effective manner (Council of the European Union, 2001a) the issue of the ICT development strategy in courts was first raised. Thus, it was essentially recognized for the first time that the process of digitalization of the judicial system is of strategic importance for its further development.

The guidelines contained in Recommendation Rec(2001)3 of the Committee of Ministers to member states on the delivery of court and other legal services to the citizen through the use of new technologies were important for the human orientation of the use of ICT in judicial procedures: (i) it should be as easy as possible to communicate with the courts and other legal organisations (registries, etc.) by means of new technologies; (ii) electronic information about the court procedures should be available to the public and disseminated using the most widely available technologies (currently the Internet), the state should, whenever possible, guarantee the authenticity and integrity of the information disseminated by it to the public or to private sector suppliers; (iii) all legal information systems should be constructed in a user-friendly manner including effective assistance components in order to allow even the occasional user to achieve sufficient retrieval results; the user is entitled to expect that officially printed legal materials are also available in an electronic form (Council of the European Union, 2001b).

Recommendation Rec (2003)14 of the Committee of Ministers to member states on the interoperability of information systems in the justice sector recognized “that information technology has become indispensable for efficient functioning of the justice system, especially in the light of the increasing workload of the courts and other justice sector organisations” (Council of the European Union, 2003a). It contained general requirements for the content of the strategy of digitalization in the area of justice. Such a strategy should, among other things, provide: stage-by-stage computerisation of the justice system; the establishment of communications infrastructure, including e-mail facilities; the development of an integration

strategy to allow for system-to-system communication; the harmonisation of information to the extent needed; the establishment of an integrated system for data collection and statistical analysis; the introduction of a common management information system; the establishment of common internal information registers; the development of standard software for databases.

In accordance with Recommendation CM/Rec (2009)1 of the Committee of Ministers to member states on electronic democracy (e-democracy) (Council of the European Union, 2009b), adopted on 18 February 2009, the elements of e-justice are informative court websites, national and international portals, the development of online “case tracking” systems, the use of videoconferencing techniques and standards for the electronic exchange of information. E-justice is an important aspect of e-democracy and its main aim is to improve the efficiency of the judiciary and the quality of justice. E-justice performs the following functions: (i) to improve the quality of judicial services for people and businesses by using ICT; (ii) to speed up court proceedings, enhance general service quality and improve transparency; (iii) to provide access to legal and judicial information for the public.

#### *Aims of e-justice in the EU*

Opinion No (2011)14 of the Consultative Council of European Judges (CCJE) for the attention of the Committee of Ministers of the Council of Europe on justice and information technology (IT) indicates that the introduction of ICT in courts should not harm the authority and staffing of the judicial system; ICT must be suitable for the judicial process, and for all aspects of a judge’s work; judges should not be subject, for reasons solely of efficiency, to the imperatives of technology and those who control it. The introduction of e-justice should be subject to human-oriented goals: (i) such justice should not be perceived by users as a purely technical process without its fundamental function of protecting human rights; (ii) the administration of justice cannot become fully automated without the participation of the human factor; (iii) legal proceedings, first of all, should contain the human factor, since here we are talking about real people and their disputes resolution; (iv) the human factor is most important in assessing the behaviour of the parties and their witnesses in the hearing, which is the component of the judge’s work; (v) the role of ICT should remain confined to substituting and simplifying procedural steps

leading to an individualised decision of a case on the merits; (vi) ICT cannot replace the judge’s role in hearing and weighing the factual evidence in the case, determining the law applicable and taking a decision with no restrictions other than those prescribed by law (CCJE, 2011).

In Resolution “Equality and non-discrimination in the access to justice” the Parliamentary Assembly of the Council of Europe expressed the view that judicial reforms implemented in a number of EU member states, accompanied by a reduction in the number of judicial bodies, should be compensated by the development of e-justice. This trend should not be used to the detriment of people who do not have access to the Internet (Parliamentary Assembly of the Council of Europe, 2015a).

The Parliamentary Assembly of the Council of Europe Report “Access to justice and the Internet: potential and challenges”, 2015, stated that Member States should continue to invest in the development of safer, more effective and more accessible online dispute resolution and ICT application. At the same time, they should continue to assess the successes and potential risks of online dispute resolution and ICT in terms of access to justice, and keep an eye on developing technologies and their use in online dispute resolution and courtroom procedures (Parliamentary Assembly of the Council of Europe, 2015b).

#### *Principles of digitalization of the judiciary in the EU and their importance for the development of the judiciary in Ukraine*

Based on an analysis of the practice of European states in the digitalization of the judiciary, the European Commission for the Efficiency of Justice adopted the Guidelines on how to drive change towards Cyberjustice (adopted by CEPEJ on 7 December 2016). The following guidelines are important: (i) the modernization of the justice system should begin with the establishment of clear goals (improving the quality of justice); (ii) ICT should be seen as a means and not as a goal of judicial reform; (iii) the introduction of cyberjustice and its tools should be guided by the court, not by technology; (iv) technology developers should strive to better understand justice and cooperate with judges and court staff; (v) ICT should promote judicial values (impartiality, independence, legal certainty, accessibility), not violate guarantees and procedural rights, in particular, such as the right to a fair trial (Paskar, 2020, p. 100-101;

South-Eastern Interregional Department of the Ministry of Justice (Dnipro), n.d.).

A key act in establishing and consolidating the principles of cyberjustice was the European ethical Charter on the use of Artificial Intelligence in the judicial systems and their environment (CEPEJ, 2018), “which was the first step of the European Commission on the effectiveness of justice to promote the responsible use of artificial intelligence in the European judicial system in accordance with the values of the Council of Europe” (Order of the Cabinet of Ministers of Ukraine No. 1556-p, 2020). Based on its analysis, the following principles can be attributed to the basic principles of artificial intelligence in legal proceedings: (i) respect for fundamental human rights (the introduction of artificial intelligence within, in a manner and in order not to violate fundamental human rights guaranteed at the international and national levels); (ii) non-discrimination (preventing the development or intensification of any discrimination between people or groups of people); (iii) quality and safety (court decisions and the data used in them must be protected and in a safe technological environment); (iv) transparency, impartiality and fairness (in the case of using artificial intelligence to ensure the absence of the human factor (to prevent human intervention)); (v) user control (guarantees a high level of autonomy, user awareness, etc.) (Karmaza, Fedorenko, 2021, p. 22). As the first international document that at the European level settled the issue of introducing ethical principles for the use of artificial intelligence in legal proceedings, this Charter has acquired historical significance and points to global transformations in all spheres of public life and the final transition of mankind to the information and digital era (Paskar, 2020, p. 101).

In 2019, the Committee of Ministers of the Council of Europe adopted an important document on the application of electronic evidence in court proceedings – Guidelines of the Committee of Ministers to member states on electronic evidence in civil and administrative proceedings (Council of the European Union, 2019c). This document defines electronic evidence as any evidence derived from data contained in or produced by any device, the functioning of which depends on a software program or data stored on or transmitted over a computer system or network. The basic principles of using electronic evidence are also defined (Chvankin, 2021, p. 66-68).

In 2019, the European Commission for the Efficiency of Justice approved the Toolkit for supporting the implementation of the Guidelines on how to drive change towards Cyberjustice (CEPEJ, 2017), which contains an executive summary of the key guidelines and principles on how to drive change towards cyberjustice; a roadmap to support the design and the management of an IT strategy in a justice system; an executive outline to support the building of a Case Management System (CMS) with a user perspective; a checklist on the different steps and actions to be taken while designing, developing and implementing an IT project within a justice system; a grid for evaluating the different dimensions of an IT project. These documents were prepared in order to fully support the judicial authorities of the Council of Europe member states in the effective management of digital transformation processes in the area of justice. Their main goal is to facilitate the understanding of the main principles and steps for the introduction of e-justice in the judicial system, described in more detail in the Guidelines on how to drive change towards cyberjustice, as well as to clearly define the measures necessary for the implementation of various IT projects of this kind and to help government agencies in solving problems related to the implementation of e-justice (Yurydychna Hazeta, 2019).

Important for deepening the processes of digitalization of the judiciary were the Council of the European Union Conclusions “Access to justice – Seizing of Opportunities for Digitalization” (Council of the European Union, 2020). Noting that the further digitalization of the judicial systems of member states has enormous potential to continue to facilitate and improve citizens’ access to justice throughout the EU, the Council of Europe proposes to encourage EU member states to make greater use of digital tools for promoting swift, convenient, secure, trusted and widespread access to the justice system; digital solutions should, where possible, be developed for the entire course of judicial proceedings. The Council of Europe stresses nevertheless that employing digital technologies and means of electronic communication should not undermine the right to a fair hearing, in particular the right to equality of arms and the right to adversarial proceedings, the right to a public hearing, including in certain cases the right to an oral hearing in the physical presence of the affected party, as well as the right to appeal. The Council of Europe recognises nonetheless that it is necessary to retain traditional non-digital processes and, where

available, physical helpdesks, alongside the new digital forms so as to provide citizens who cannot yet fully participate in technological developments with effective legal protection and access to justice. The use of digital technologies in the justice sector must meet with the latest standards for information and cyber security and fully comply with privacy and data protection legislation. The use of artificial intelligence tools should not interfere with the powers of judges to make decisions or the independence of judges (a court decision should always be made by a person and cannot be delegated to an artificial intelligence tool).

The set of tools for the digitalization of the judiciary is defined in the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions “Digitalization of Justice in the European Union. A toolbox of opportunities” (European Commission, 2020). It is emphasized that in order to achieve a fully-fledged area of freedom, security and justice, it is important that all member states work towards reducing the existing digitalisation gaps, fragmentation between national justice systems and leverage the opportunities available under the relevant EU funding mechanisms. The tools of the proposed toolbox are categorised as follows: (i) financial support for member states to use the potential for creating long-term impact; (ii) legislative initiatives to set the requirements for digitalisation in order to promote better access to justice and improved cross-border cooperation, including in the field of artificial intelligence; (iii) IT tools which can be built upon in the short to medium term and used in all member states; (iv) promotion of national coordination and monitoring instruments which would allow regular monitoring, coordination, evaluation and exchange of experiences and best practices.

*Guidelines of the Committee of Ministers of the Council of Europe on online dispute resolution mechanisms in civil and administrative court proceedings*

The Guidelines of the Committee of Ministers of the Council of Europe on online dispute resolution mechanisms in civil and administrative court proceedings (16 June, 2021) are of great importance for the digitalization of the judiciary in terms of online dispute resolution. They provide the following principles: online dispute resolution mechanisms (ODR) should be accompanied by reliable guarantees of human rights; ODR should be

easily understood, affordable and user friendly so that it can be used comfortably by as many people as possible; parties should be informed about how ODR operates, how to file an application, how to monitor progress of the proceedings and how to access decisions; use of ODR should not be disadvantageous to the parties or give unfair advantage to one of the parties; ODR should be designed and implemented in accordance with internationally recognised technical standards, in order to allow its use by as many people as possible with as much autonomy as possible; participation in ODR proceedings should not prejudice an individual’s right to participate effectively in the proceedings or their right to an effective remedy; ODR proceedings should ensure an independent and impartial adjudicative process; parties to proceedings involving ODR should have knowledge of the materials in the case file, including those submitted by the other parties; they should have access to these materials and sufficient time and means to acquaint themselves with their contents (Council of the European Union, 2021).

*Some features of the introduction of European legal standards in the area of digitalization of the judiciary in Ukraine*

Comprehensive implementation of European legal standards in the area of digitalization of the judiciary in Ukraine is an important and urgent task at the present stage of Ukrainian judicial reform.

Such implementation took place in Ukraine in the context of two dominant courses of legal policy that replaced one another. According to the first course, that lasted until 2014 (before the ratification of the Association Agreement between Ukraine and the EU), European standards of digitalization of the judiciary in Ukraine were used chaotically and haphazardly, without implementation at the strategic legal level. After 2014, especially after 2019, when the course towards European integration of Ukraine was fixed at the constitutional level, these standards acquired a legally binding meaning and began to be implemented systematically. It was confirmed by their fixation at the level of two key strategic documents in the area of judicial reform – the Strategy for Reforming the Judiciary, justice and related legal institutions for 2015–2020 (Decree of the President of Ukraine No. 276/2015, 2015), and the Strategy for the Development of the Justice System and Constitutional Justice for 2021–2023 (Decree of the President of Ukraine, No. 231/2021, 2021).

The latter directly involves the implementation of international standards and best practices of the Council of Europe and the European Union in the area of the judiciary and legal proceedings. For sure it extends to the concept of an e-court, which is mentioned in both strategies among the key legal innovations.

For the implementation of the Strategy for the Development of the Justice System and Constitutional Justice for 2021–2023, the Concept of the Informatization Program for Local and Appellate Courts and the Project for Building a Unified Judicial Information and Telecommunication System for 2022–2024 (UJITS) (Order of the State Judicial Administration of Ukraine No. 178, 2022) were also adopted. This Program identified the main directions for improving access to justice: creation of conditions for intensifying the introduction of information technologies in the courts' activities, bodies and institutions of the justice system; ensuring the automation of their work; the development of e-justice according to the world standards in the area of information technology; e-justice integration into the national e-governance infrastructure.

Digitalization of the judiciary in Ukraine occurs with a certain delay compared to the EU as the starting point is the adoption of the Law of Ukraine “On Access to Court Decisions” (Law of Ukraine No. 3262-IV, 2005). For the implementation of its provisions the Decree of the President of Ukraine “On the Concept of Improving the Judiciary to Establish a Fair Trial in Ukraine in Accordance with European Standards” (Decree of the President of Ukraine No. 361/2006, 2006) was adopted where the issues of forming an e-court in Ukraine were raised for the first time (Smokovych, 2020, p. 44; Shcherbliuk, 2021, p. 157). In accordance with the Decree, the State Judicial Administration in 2005 developed and approved the Concept of the Unified Judicial Information and Telecommunication System. The main purpose of its creation and functioning is information and technological support of justice on the principles of balance between the need of citizens, society and the state in the free exchange of information and the necessary restrictions on its dissemination (Politanskyi, 2020, p. 37-38; State Judicial Administration of Ukraine, 2022).

In addition, in Ukraine such digitalization unfolded without fixing its essence, goals, tasks, directions, etc. at the strategic legal level. The Concept of the Unified Judicial Information and Telecommunication System was not able to

provide legal level, as it concerned only a fragmentary issue and did not consider the digitalization of the judiciary as a complex legal process. Even the adoption of the Strategy for Reforming the Judiciary, justice and related legal institutions for 2015–2020 and the Strategy for the Development of the Justice System and Constitutional Justice for 2021–2023 did not significantly change the situation. In these acts the issues of digitalization of the judiciary were mentioned in passing, in the context of other issues of judicial reform and the development of judicial institutions. Thus, the lack of a strategic level of legal planning for the digitalization of the judiciary in Ukraine, which persists until now, contradicts the European standards of judicial digitalization and provokes chaotic and unsystematic legal decisions in this area. It testifies to frequent adjustment of judicial and procedural legislation by the Verkhovna Rada of Ukraine and does not provide predictability and gradual process of organizational and legal changes that occur during the digitalization of the judiciary in Ukraine.

## Conclusions

European legal standards for the digitalization of the judiciary are typical principles and norms that are fixed in the main sources of law of the European legal system and are the minimum legal requirements for the judicial systems of the EU member states. They are divided into those that are binding and those that are advisory in nature. It corresponds to the paradigm of coexistence of “hard” and “soft” law in the EU legal system.

European standards of digitalization of the judiciary are guidelines for the national legislator, which are aimed at qualitative improvement of the justice system itself by ensuring the unity of judicial practice; removing the elements of stiffness, that is, giving it the dynamism and flexibility necessary for the current pace of social and legal development; expanding the scope of informing society about judicial activities.

The direct benefit of the European standards of digitalization of the judiciary for the improvement of the judiciary and the judicial system of Ukraine is that they guide the national legislator on the regulation of judicial procedures that take into account the importance and necessity of (i) arrangement of different jurisdictions courts with the latest means of communication (both with other judicial institutions and parties in the trial); (ii) providing

of available and reliable information on litigation in electronic form; (iii) designing all legal information systems of the court in a user-friendly way, including effective components of assistance, so that a random user can receive sufficient search results; the user has the right to expect that officially published legal materials are also available in electronic form.

At the same time, European standards of digitalization of the judiciary through the Guidelines on electronic evidence in civil and administrative proceedings guide the national legislator in Ukraine to formalize the concept of “electronic evidence”, relying on its definition introduced in the EU, as well as the principles of using electronic evidence.

Equally important and useful for the development of legal proceedings and the judicial system in Ukraine is the definition in the European basic principles of artificial intelligence in legal proceedings, which should be incorporated into the relevant procedural codes of Ukraine that determine certain forms of judicial proceedings.

The main elements of e-justice, implemented in Ukraine under the influence of European standards, can be considered as follows: (i) conducting electronic office work, preserving cases and centralized storage of procedural and other documents in a single database; (ii) exchange of documents and information (sending and receiving documents and information, joint work with documents) in electronic form between the courts, participants in the trial; (iii) receipt of court summons, notices, decisions, information on the date and place of consideration of the case by electronic means of communication; (iv) electronic method of determining the judge (judge-rapporteur) to consider a particular case; (v) using ICT to investigate electronic evidence; (vi) participation of trial parties in the hearing via videoconference; (vii) audio and video recording of court hearings; (viii) adoption and publication of judicial acts in electronic form; (ix) transfer for execution and enforcement of court decisions in electronic form; (x) electronic system of personnel management, financial and accounting in courts; (xi) electronic system of judicial statistics; (xii) electronic archives and e-court library. Therefore, on the formal side, there may be an impression of consistent implementation of European standards of digitalization of the judiciary in Ukraine. However, careful analysis shows that this conclusion is premature, despite significant normative and organizational work in

this direction. Thus, until now, Ukraine has not formed a unified information space for courts, bodies and institutions in the justice system. The existing information and communication infrastructure of courts, bodies and institutions in the justice system requires significant improvement and optimization, reducing budget expenditures for its maintenance. The key task of ensuring the availability of information for trial parties and the maximum transparency and openness of the justice system for society has not been solved for the digitization of the judiciary.

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## Social policy for the development of educational inclusion in Ukrainian schools: a pedagogical analysis

### Política social para el desarrollo de la inclusión educativa en las escuelas ucranianas: un análisis pedagógico

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#### Abstract

The main purpose of the article is to formulate an effective policy for the development of inclusiveness in education. For this purpose, the object of research will be school educational institutions in Ukraine. The scientific task will include modeling the most significant educational factors influencing the formation of modern social policy for the development of inclusiveness in school institutions. The research methodology involves the use of graph theory and the connection graph method to identify the most significant impact factors. As a result of the analysis, the two most significant factors influencing the formation of modern social policy for the development of inclusiveness in school institutions were identified. Based on this, the key principles for the formation of modern social policy for the development of

#### Resumen

El objetivo principal del artículo es formular una política eficaz para el desarrollo de la inclusión en la educación. Para ello, el objeto de la investigación serán las instituciones educativas escolares de Ucrania. La tarea científica incluirá la racionalización de los factores educativos más importantes que influyen en la formación de una política social moderna para el desarrollo de la inclusión en las instituciones escolares. La metodología de investigación implica el uso de la teoría de grafos y el método del gráfico de conexión para identificar los factores de impacto más significativos. Como resultado del análisis, se identificaron los dos factores más importantes que influyen en la formación de una política social moderna para el desarrollo de la inclusión en las instituciones escolares. A partir de esto, se presentaron los principios clave para la formación

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inclusiveness in school institutions were presented. The study has a limitation by not taking into account other educational institutions, only schools. Further research should be devoted to exploring the formation of social policies for the development of inclusiveness in universities.

**Keywords:** pedagogy, inclusiveness, schools, students, social policy.

## Introduction

In the context of modern education reform, inclusion is becoming particularly relevant as a means of open access for all citizens without exception to the service sector. The process of introducing inclusive education, which began in the 90s of the twentieth century, covered all links and levels of the education system, activated scientists to find effective ways to include people with special educational needs in the educational and social space, and necessitated the need for teachers to review the organization of their own activities and work methods in an educational institution. Active interest in theoretical and practical issues of educational and social inclusion ensures the updating of the scientific approach to the introduction of sound technologies and proven methods into the educational process, determines the criteria and indicators of the development of an individual included in a specific environment. Social policy aimed at developing inclusiveness in schools is vital for several compelling reasons. Firstly, inclusiveness ensures that every student, regardless of their background, abilities, or disabilities, has equal access to educational opportunities. In a world that increasingly values diversity and equity, schools play a pivotal role in laying the groundwork for a society that upholds these principles. By fostering an environment where all students feel accepted and supported, schools can promote better learning outcomes and help in reducing societal inequalities. Secondly, inclusive education is essential for preparing all students for a globalized world. Today's students will become tomorrow's workforce, collaborating with people from diverse backgrounds and cultures. Schools that embrace inclusiveness teach students to understand and respect differences, which are critical skills in the global market. Furthermore, inclusiveness helps to build empathy among students, as they learn to see the world from multiple perspectives and understand the challenges faced by others.

de una política social moderna para el desarrollo de la inclusión en las instituciones escolares. El estudio tiene una limitación al no tomar en cuenta otras instituciones educativas, solo escuelas. Se deberían dedicar más investigaciones a explorar la formación de políticas sociales para el desarrollo de la inclusión en las universidades.

**Palabras clave:** pedagogía, inclusión, instituciones escolares, estudiantes, política social.

The importance of inclusiveness is also supported by educational research, which shows that inclusive settings can benefit all students, not just those who receive special education services. Inclusively designed educational environments can lead to improved problem-solving skills and higher levels of engagement among students. When students with diverse needs learn together, it encourages a dynamic environment where different approaches to learning are valued and explored, enhancing educational outcomes for everyone. Moreover, inclusiveness in schools can lead to long-term societal benefits. Schools that successfully implement inclusive policies help to cultivate a culture of acceptance and understanding. This, in turn, can decrease rates of discrimination and social exclusion as individuals who are educated in diverse settings are more likely to appreciate diversity and contribute positively to society. Inclusive education also promotes social mobility by giving all children, regardless of their socioeconomic status or other personal characteristics, a fair chance to succeed. Finally, developing inclusiveness in schools is essential today because it aligns with broader human rights principles. Education is recognized universally as a fundamental human right, and inclusiveness ensures that this right is upheld in an equitable manner. By integrating inclusiveness into school policies, educational systems not only comply with legal and ethical standards but also promote a just society. As such, inclusiveness is not merely an educational tool but a crucial policy for fostering justice and equality in increasingly diverse societies.

The structure of the article presupposes a review of the literature (a review of the most relevant scientific and theoretical works was conducted), the introduction of key research methods (the content of the used methods is described) and the selection of the main results of the analysis (what was achieved in the results is highlighted). The main purpose of the article is to formulate an effective policy for the development of

inclusiveness in education. For this purpose, the object of research will be school educational institutions in Ukraine.

### Literature Review

As part of the literature review, it is extremely important, especially in the context of the specified topic of inclusiveness, that we consider quite significant the need for generalizing works of researchers and practitioners, in which the authors share results and considerations for the implementation of relevant concepts, strategies, tactics, and offer the author's vision of the implementation of certain goals and objectives. At the same time, highlighting key gaps in the literature is also significant. For example, Research by Pappas, Papoutsis, & Drigas (2018) and Gómez (2016) provides insights into the policies and practices concerning inclusive education in Greece and Cuba, respectively. Pappas et al. highlight the importance of national attitudes and governmental policies in shaping the efficacy of inclusiveness strategies, suggesting that inclusiveness is not just an educational challenge but also a socio-political issue that varies significantly from one cultural context to another. Similarly, Gómez examines the Cuban educational system, noting its unique approach to inclusiveness, which offers a comparative perspective to the Ukrainian context in our study. The studies by Koval et al. (2022) and Shanskova et al. (2021) focus on the training of future teachers in Ukraine, emphasizing the critical role of pedagogical innovations and methodological preparations in fostering inclusiveness. These studies argue that teacher preparedness in the new Ukrainian school system is pivotal for implementing inclusive education effectively. They provide evidence that educational reforms and teacher training programs must be aligned with inclusive education principles to ensure that future educators are equipped to handle diverse classroom settings.

Khusheim (2022) explores the social integration and self-concept of students with special educational needs, offering valuable insights into the individual-level impacts of inclusive policies. This study underscores the necessity of understanding the personal experiences of students to assess the effectiveness of inclusiveness strategies. The findings suggest that policies should not only focus on systemic changes but also on the nuances of individual student experiences in educational environments. The research by Kryshchanovych et al. (2020) and Kravchenko & Berezynets (2020) delves into the

economic and psychological aspects of inclusiveness, respectively. These studies highlight the complexity of implementing inclusive education, which requires not only educational and pedagogical adjustments but also economic resources and psychological support systems. They point out that inclusiveness is an interdisciplinary challenge that encompasses various domains beyond traditional educational methodologies.

In other hand, Florian (2014) discusses what constitutes evidence in the field of inclusive education, questioning traditional metrics and advocating for a broader perspective on evidence that encompasses more qualitative and nuanced aspects of educational experiences. This perspective is crucial as it emphasizes the need for a richer, more diversified understanding of how inclusive practices affect educational outcomes, which is vital for the formulation of effective policies. Risner, Gauntlett, & Culpepper (2022) explore the concept of social practices within creative educational settings, providing insights into how everyday creativity can be a vital part of inclusive education. Their findings suggest that fostering creative environments can contribute significantly to inclusiveness, offering students multiple ways to engage and excel. Shlomo, Levy, & Itzhaky (2012) focus on the development of professional identity among social work students, shedding light on the educational processes that contribute to forming professionals equipped to handle inclusivity. Understanding these processes is important for developing educational policies that support the cultivation of professionals who can effectively implement inclusive practices.

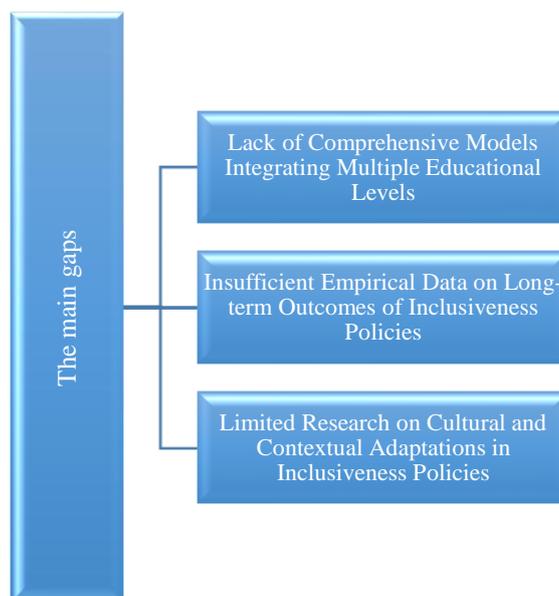
Altinay et al. (2020) examine readiness for online learning as a component of smart university initiatives, which relates to inclusiveness in the context of accessibility and the adoption of new technologies. Their research underscores the importance of technological preparedness as a significant factor in the inclusivity of educational environments, particularly relevant in the shift toward more digital learning spaces. Morozova (2012) discusses the monitoring of informational-communicative competence, which is increasingly relevant in today's digital learning environments. This work highlights the importance of competencies that enable students and educators to navigate and utilize digital tools effectively, an essential aspect of modern inclusive educational strategies. Shanskova et al. (2021) and Kravchenko & Berezynets (2020), both focusing on the Ukrainian educational context, provide a localized understanding of

how professional training and social policy functions within the country. These studies are particularly valuable for their direct relevance to the main research subject, offering specific insights into the challenges and opportunities within Ukraine's evolving educational landscape.

Rademacher & Koglin (2019) offer a systematic review of the concept of self-regulation in preschoolers and its correlation with their social-emotional development. Their work underscores the importance of early self-regulation skills as a cornerstone for later social and educational inclusion. They argue that self-regulation is crucial for enabling children to manage their emotions and behaviors effectively, which in turn facilitates smoother integration into school environments. This perspective is essential for informing policies that aim to support children from their early years, ensuring that they develop the necessary skills to navigate the complexities of a diverse educational landscape. On the other hand, Soloviova et al. (2020) explore the broader systemic factors influencing the social development of individuals with disabilities in Ukraine. Their research highlights the significant influence that the educational system has on the social integration and development of people with disabilities. By analyzing policies and practices within Ukrainian education, they provide insights into the successes and shortcomings of current approaches to inclusiveness. Their findings suggest that while there have been advancements in policy and practice, significant gaps remain, particularly in the consistency of implementation and the adaptation of educational environments to meet diverse needs.

The methodologies of the referenced studies primarily focus on qualitative and comparative analyses, exploring the impact of inclusiveness in various educational settings. For instance, the studies by Pappas et al. (2018) and Gómez (2016) utilize case studies and policy reviews to examine how national attitudes and governmental policies shape inclusiveness in Greece and Cuba, offering insights that are valuable for contrasting with the Ukrainian system. In terms of results, these studies underscore the socio-political dimensions of inclusiveness and the critical role of teacher preparedness, as highlighted by Koval et al. (2022) and Shanskova et al. (2021) in the Ukrainian context. These results emphasize that effective teacher training programs are crucial for the successful implementation of inclusive education. The limitations of these studies often revolve around their focus; for example, many are restricted to specific geographic or cultural contexts, which may not universally apply to other settings, and some lack comprehensive data across all relevant educational levels, as seen in studies focusing solely on schools but not extending to higher education.

This literature review illustrates that inclusiveness in education is a dynamic field influenced by a myriad of factors that extend beyond the classroom. The insights gained from these studies are instrumental in guiding our investigation into the development of social policies aimed at inclusiveness in Ukrainian school institutions, highlighting the need for comprehensive strategies that address both educational practices and broader socio-political contexts (Fig.1).



**Figure 1.** The main gaps in literature (formed by authors)

Thus, the identified gaps in the literature show that there are a number of unresolved issues. Therefore, you should formulate the following, your own scientific task: modeling the most significant educational factors influencing the formation of modern social policy for the development of inclusiveness in schools.

### Methodology

That the abstract-logical method was used within the framework of drawing conclusions. However, there are also more specific ones. Let's look at them in more detail in this chapter. Graph theory provides a robust mathematical structure to examine the relationships and interdependencies between various educational factors. By representing these factors as vertices and their interactions as edges within a graph, we can visualize and quantify the complexity of their relationships. This method allows us to pinpoint which factors are central to the network, thereby identifying those with the most significant influence on policy development. The strength of graph theory lies in its ability to offer clear, quantifiable insights that are crucial for forming effective and targeted educational policies. The connection graph method complements our use of graph theory by providing a more nuanced analysis of how educational factors are interconnected. This method involves creating a connection graph where nodes represent the educational factors, and edges denote the strength and nature of the influence between them. By analyzing these connections, we can identify which factors are pivotal in shaping inclusive policies. This method is particularly

powerful for revealing hidden patterns and dependencies that might not be apparent through traditional analytical approaches.

The combination of graph theory and the connection graph method provides a comprehensive toolkit for our research. These methodologies are particularly suited to our study's needs due to their ability to handle complex networks of relationships and influences efficiently. They offer both macro and micro-level insights, enabling us to formulate a holistic understanding of the factors that drive inclusiveness in school policies. The rigorous analytical capability they provide ensures that our policy recommendations are grounded in empirical evidence and have a high potential for real-world applicability and impact.

In our study on educational inclusion in Ukrainian schools, we utilized graph theory and the connection graph method to map and analyze relationships between various educational factors. Initially, we gathered data from diverse sources, including policy documents, academic research, and expert interviews, to identify and categorize key educational factors such as teacher training, accessibility of resources, and legislative frameworks. These factors were represented as nodes in our graphs, with edges depicting their interactions and influences based on strength and direction, informed by our data analysis. We then applied network analysis techniques to identify central nodes and influential pathways, providing a quantitative foundation for our policy recommendations. To validate our results, we conducted expert reviews

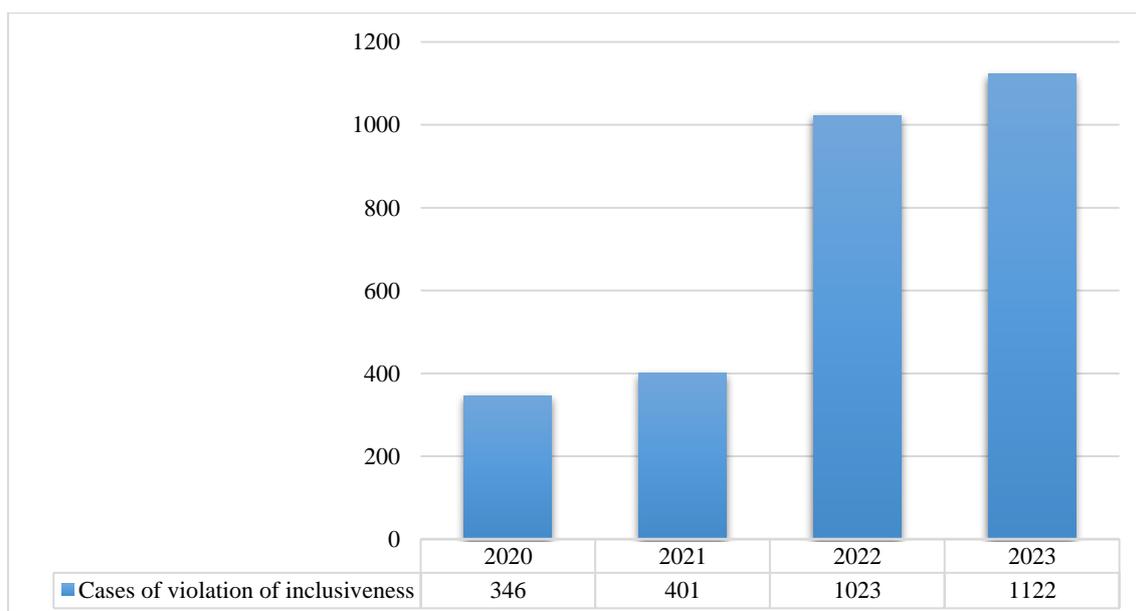
and sensitivity analyses, comparing our findings with existing literature and adjusting parameters to test the robustness of our conclusions. This comprehensive approach ensured that our recommendations were well-supported by empirical evidence and expert consensus, offering a replicable model for similar research in other contexts.

### Results and Discussions

Democratic changes in public life have led to a new vision, understanding and revaluation of many permanent provisions and values; in particular, special education has not bypassed these trends. As a result, at the present stage, inclusive education has become one of the alternative forms of education for children with special needs. Inclusive education involves a child with special needs staying in a mainstream general education preschool or school institution, acquiring knowledge, skills and abilities in the same time frame as a healthy child.

The significant increase in cases of discrimination and violations of inclusivity in Ukrainian schools during 2022-2023 can be largely attributed to the destabilizing impacts of the ongoing war. The conflict has exacerbated pre-existing social divisions and introduced new challenges that strain the educational system's ability to maintain inclusive practices. Firstly, the war has led to a large-scale internal displacement of populations, resulting in classrooms that are more diverse and overcrowded than before. This sudden influx of students from different

regions—each with unique dialects, cultural norms, and educational backgrounds—has overwhelmed many school systems. Teachers, many of whom are not trained in handling such diversity under normal circumstances, are now under even greater pressure. The stress and trauma of war have also affected students' behavior and their interactions with peers, potentially leading to increased instances of discrimination as students may struggle with feelings of resentment, fear, or misunderstanding towards those from different backgrounds. Furthermore, the war's impact on the Ukrainian infrastructure has severely hindered the implementation of inclusive education policies. Many schools have been damaged or repurposed, resources have become scarcer, and there is a significant disruption in training and support for educators on inclusivity practices. The focus of school administrations and government bodies has understandably shifted towards immediate survival needs, such as physical safety and psychological support, often at the expense of inclusivity initiatives. This shift can lead to neglect of anti-discrimination policies and insufficient attention to the unique needs of vulnerable groups within the school population, such as students with disabilities, ethnic minorities, and economically disadvantaged students. These challenges are compounded by the fact that the war has not only diverted financial resources but also the attention of policymakers away from educational reforms aimed at enhancing inclusivity, thereby allowing discrimination to rise unaddressed during this tumultuous period (Fig.2).



**Figure 2.** Dynamics of the number of inclusivity violations in Ukrainian schools for the period 2020-2023 (formed by authors)

The main goal of inclusive education and upbringing is to create conditions for personal development, creative self-realization and affirmation of the human dignity of children with special needs. The main objectives of inclusive education and upbringing are: ensuring the right of children with special needs to receive education in general education institutions in a comprehensive combination with correctional and rehabilitation measures; comprehensive development of the child's individuality based on identifying his inclinations and abilities, the formation of interests and needs; maintaining and strengthening the moral and physical health of students; instilling in students a love of work, providing them with pre-professional training, providing conditions for life and professional self-determination; educating the student as a cultural and moral person with a moral attitude towards the world around him and himself; provision of qualified psychological, medical and pedagogical assistance in the process of training and education, taking into account the health status and characteristics of the psychophysical development of the pet. But along with this, the problem is also at the level of formation of social policy, which is influenced by a number of factors:

X1. Increased Diversity and Overcrowding. The internal displacement caused by the war has led to a significant increase in the diversity and number of students per classroom, which can strain resources and complicate the delivery of personalized and inclusive education.

X2. Teacher Preparedness. Many educators are not sufficiently trained to handle the increased diversity and special needs that arise in war conditions, impacting their ability to provide inclusive education effectively.

X3. Infrastructure Damage and Resource Scarcity. The physical destruction of school facilities and the diversion of educational resources towards emergency relief efforts hinder the ability to maintain inclusive educational environments.

X4. Psychological Impact on Students. The trauma and stress experienced by students due to the war can lead to behavioral issues and affect peer interactions, increasing the risk of discrimination and exclusion.

X5. Shift in Policy Focus. With the urgent need for safety and psychological support, there may be less attention and fewer resources dedicated to inclusivity policies, leading to their neglect.

X6. Economic Constraints. The economic downturn caused by the war limits the availability of funds needed to implement inclusivity programs, such as specialized training for teachers or adapted learning materials.

X7. Government and Administrative Attention.

The war can divert the focus and efforts of policymakers and school administrations away from inclusivity initiatives towards more immediate survival needs.

To describe the semantic network, we will use the constructions of the language of predicates consisting of simple (atomic) predicates and logical connections for isolated factors:  $\wedge$  – logical "and";  $\vee$  – logical "or";  $\leftarrow$  – logical "if";  $\forall$  is the commonality quantifier (for all);  $\exists$  is an existence quantifier (there is at least one). Therefore, we have the following relationships between the factors:

$(\forall xi) [\exists(x1) \leftarrow \text{determines } (x1, x2) \wedge \text{predicts } (x1, x4) \wedge \text{conditions } (x1, x7)];$

$(\forall xi) [\exists(x2) \leftarrow \text{conditions } (x2, x3) \wedge \text{determines } (x2, x1) \wedge \text{conditions } (x2, x4) \wedge \text{determines } (x2, x5) \wedge \text{conditions } (x2, x7)];$

$(\forall xi) [\exists(x3) \leftarrow \text{conditions } (x3, x7) \wedge \text{conditions } (x3, x2) \wedge \text{conditions } (x3, x5) \wedge \text{predicts } (x3, x6)];$

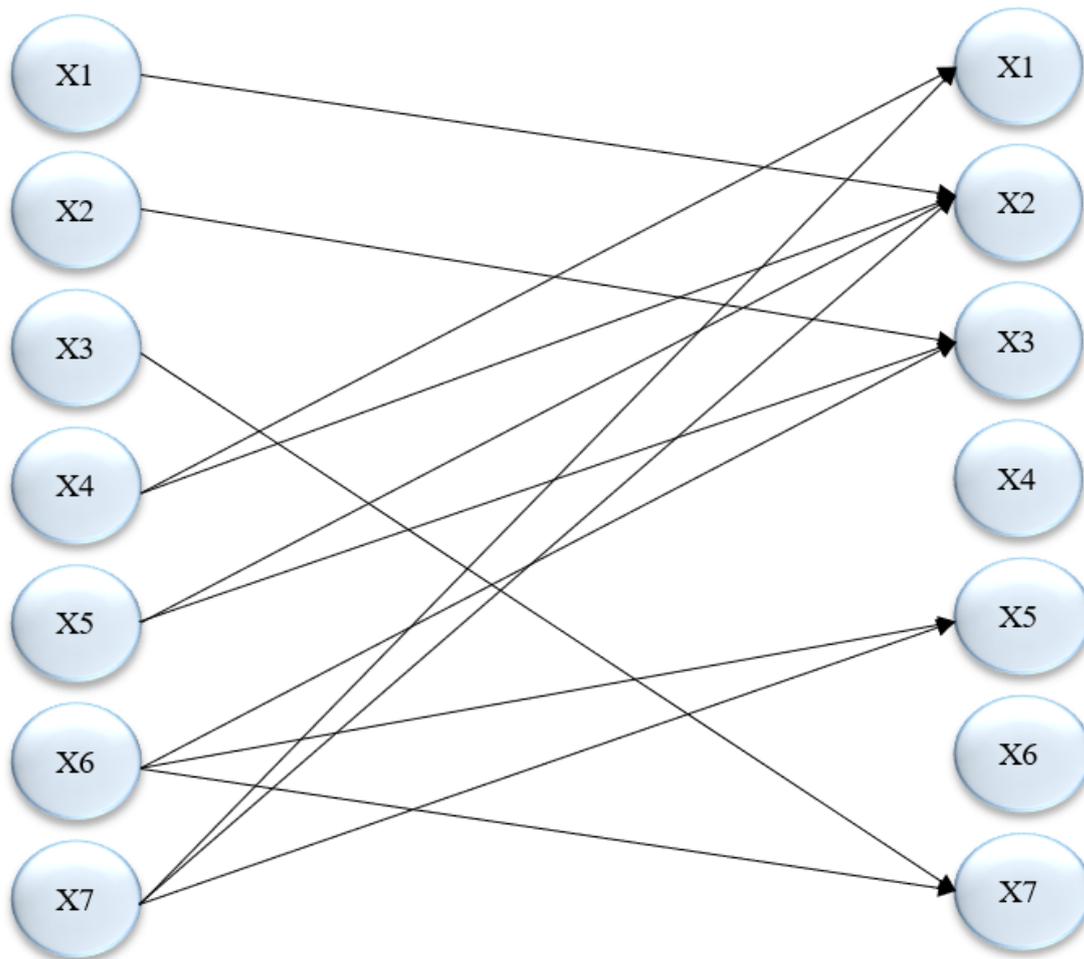
$(\forall xi) [\exists(x4) \leftarrow \text{predicts } (x4, x1) \wedge \text{conditions } (x4, x2)];$

$(\forall xi) [\exists(x5) \leftarrow \text{determines } (x5, x2) \wedge \text{conditions } (x5, x3) \wedge \text{conditions } (x5, x6) \wedge \text{affects } (x5, x7)];$

$(\forall xi) [\exists(x6) \leftarrow \text{predicts } (x6, x3) \wedge \text{conditions } (x6, x5) \wedge \text{conditions } (x6, x7)];$

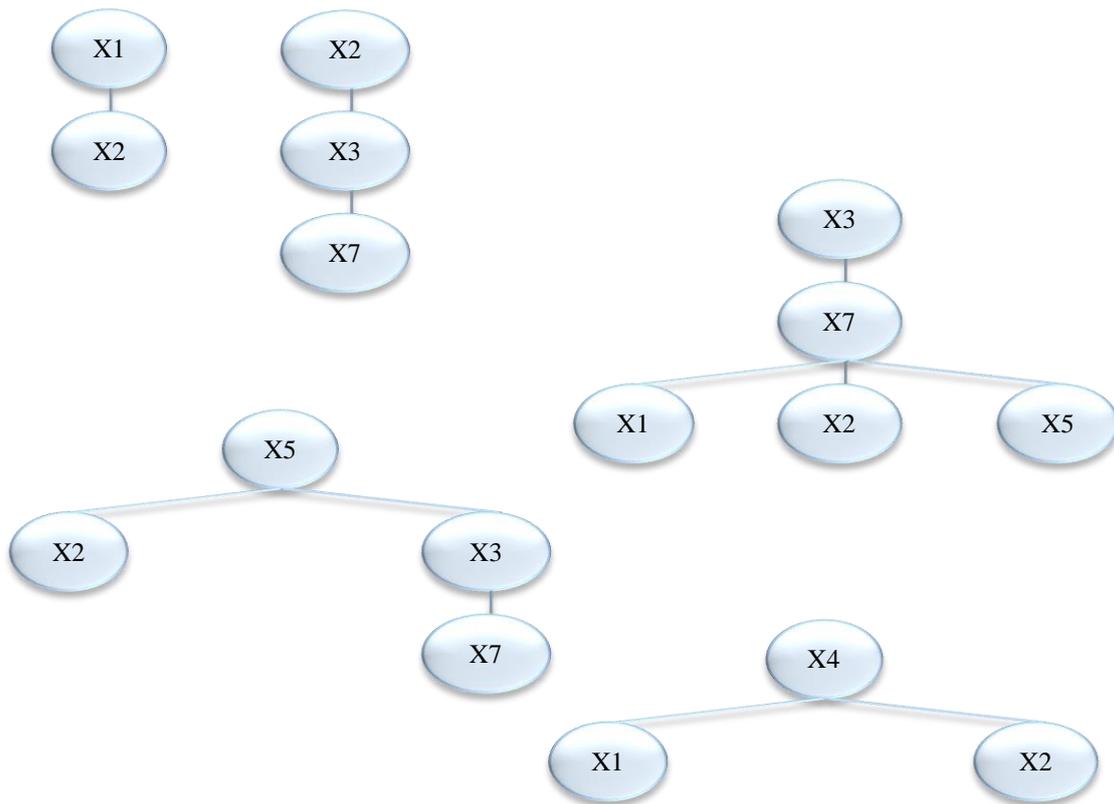
$(\forall xi) [\exists(x7) \leftarrow \text{conditions } (x7, x1) \wedge \text{conditions } (x7, x2) \wedge \text{affects } (x7, x5) \wedge \text{conditions } (x7, x3) \wedge \text{conditions } (x7, x6)].$

A diagram of the relationships between factors influencing the formation of modern social policy for the development of inclusiveness in education is presented in Fig.3.



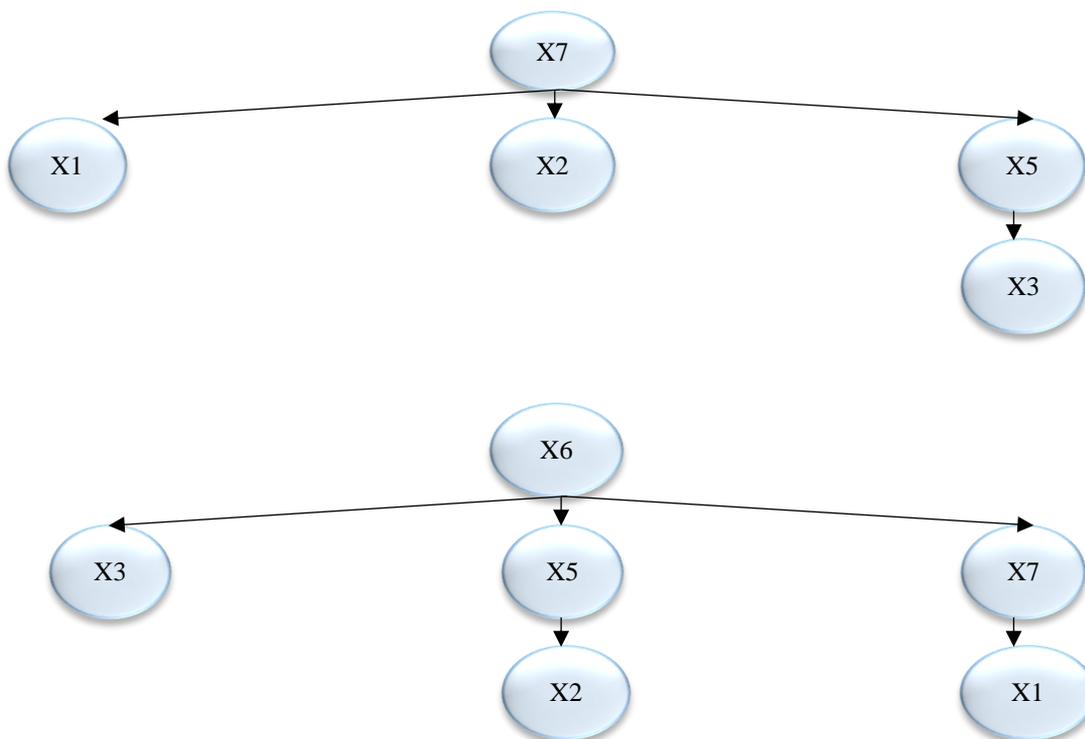
**Figure 3.** A diagram of the relationships between factors influencing the formation of modern social policy for the development of inclusiveness in education (formed by authors)

Next, we present direct connection graphs to establish the most influential and significant factors (Fig. 4).



**Figure 4.** A direct connection graphs to establish the most influential and significant factors influencing the formation of modern social policy for the development of inclusiveness in education (formed by authors)

At the same time, the most significant and influential will be X6 and X7, respectively, Fig. 5.



**Figure 5.** A direct connection graphs to establish the factors X6-X7 influencing the formation of modern social policy for the development of inclusiveness in education (formed by authors)

Given the critical role that economic constraints and the shift in government and administrative attention play in influencing inclusivity in

Ukrainian schools during wartime, a new vision for the modern social policy of inclusiveness needs to address these issues directly (Table 1).

**Table 1.**  
*Key strategies in modern social policy of inclusiveness*

Financial Resilience and Resource Allocation	Policy Focus and Administrative Support
<p>This fund would specifically target the needs of inclusive education, such as adaptive technologies, specialized teaching materials, and infrastructure adaptations that accommodate diverse student needs. Funding could come from both government allocations and partnerships with international donors and NGOs. Provide financial incentives for schools that successfully implement and maintain inclusive practices. These could include subsidies for teacher training programs in inclusivity, funds for student support services, and bonuses for schools that achieve certain inclusivity benchmarks. Prioritize inclusiveness in the national education budget, ensuring that even during economic hardships, funds are earmarked specifically for inclusivity initiatives, protecting them from cuts or reallocations to other areas.</p>	<p>Amend educational policy frameworks to place inclusiveness at the core of education reform discussions and decisions. This would involve setting clear legislative mandates that require schools to adopt and report on inclusivity measures. Develop both centralized and regional administrative bodies focused solely on inclusiveness in education. These bodies would provide oversight, guidance, and support to schools, ensuring that inclusivity policies are implemented effectively and adapted to local conditions. Implement ongoing training programs for educators and administrative staff, focusing on the development of skills needed to manage diverse classrooms and apply inclusive teaching methods effectively. This could include crisis management training, psychological first aid, and specialized pedagogical techniques tailored to the needs of displaced or traumatized students.</p>

(Formed by authors)

Discussing the results, one can still come to the conclusion that in Ukrainian society there is a set of challenges associated with the presence of problems for various groups with limited mobility regarding the possibility of full, barrier-free access to education, employment, and receiving government administrative services. The formation of an unhindered living environment in public space and access to infrastructure facilities remain relevant. When discussing the results obtained, we should not only imagine what new we obtained in the final case, but also compare them with similar ones in this area. For example, Kryshchanovych et al. (2022) and Sylkin et al. (2021) explore the development of educational culture in rural regions and the socio-economic impacts of crises on education, respectively. These studies provide a broader socio-economic and geographical backdrop against which our findings can be evaluated. While Kryshchanovych et al. focus on the administrative systems in rural educational settings, they reveal the complexities that can impact policy effectiveness, such as the specific needs of rural areas that may not be directly comparable to the urban and semi-urban schools primarily considered in our study. Sylkin et al., meanwhile, underscore the responsiveness of educational systems to external shocks, a factor our research acknowledges but does not deeply investigate. This aspect of adaptability is crucial for the formation of resilient inclusiveness policies that can sustain under various socio-

economic conditions. Our findings related to the inclusiveness in primary and secondary educational institutions resonate with those by Fuller et al. (2004) who discuss inclusiveness within higher education. Fuller et al. highlight structural and policy-driven approaches to inclusivity, similar to our emphasis on significant factors that influence policy development. However, their focus on higher education complements our research by indicating a continuum of inclusivity needs that span across different educational levels, suggesting a potential area for extending our study. Spivak et al. (2021) discuss the significance of professional identity in social work education, which aligns with our findings on the educational factors influencing policy formation. The role of professional training in fostering an inclusive mindset among future educators and administrators is a critical linkage between our studies, reinforcing the importance of systemic educational reforms at all levels. Frumos (2020) addresses inclusive education in the context of remote instruction, a rapidly growing field that our study indirectly touches upon through its focus on modern educational policies. The use of technology in enhancing inclusiveness, as discussed by Frumos, provides a practical extension to our findings, suggesting that technology integration could be one of the significant factors in future policy developments.

Finally, Ashytok (2015) and Budnyk (2014) delve into the challenges specific to inclusiveness in Ukraine, offering a direct comparison to our research. Ashytok outlines broader problems in the Ukrainian inclusive education system, many of which our study acknowledges by identifying key influencing factors. Budnyk's focus on teacher training in mountainous regions introduces another layer of complexity to inclusiveness, indicating the geographical and infrastructural challenges that might need distinct policy considerations compared to urban settings. The study by Potkány & Hajduková (2015) provides crucial insights into the role of social networks in the job search process for college students, highlighting the importance of social connectivity and networking skills as vital components of educational and post-educational outcomes. Integrating this perspective into our discussion on the development of inclusiveness in school policies offers a broader view of educational goals beyond immediate academic achievements.

By identifying the two most significant factors influencing inclusiveness, policymakers and educational administrators have a clear basis for prioritizing areas that require immediate attention. For instance, if the research highlights the pivotal role of teacher training and curriculum adaptation as key factors, educational reforms can focus on enhancing teacher preparedness programs and developing inclusive curriculum designs. These targeted actions are likely to yield more effective outcomes in creating inclusive environments that cater to diverse student needs. Additionally, the use of graph theory and the connection graph method offers a sophisticated toolset for stakeholders to continuously monitor and evaluate the impact of these implemented policies, ensuring that they can dynamically adjust strategies in response to real-world outcomes and feedback.

The implications of our findings for the formulation of social policies in Ukrainian schools stress the necessity for targeted, resilient, and inclusive strategies. Given the centrality of accessibility and psychological support uncovered in our study, policies should mandate the integration of comprehensive digital platforms to facilitate uninterrupted learning, especially in conflict-affected areas. This includes investment in digital infrastructure and training teachers to effectively deliver online education. Equally important is the establishment of mandatory mental health programs within schools, which would include regular training for

teachers in trauma-responsive educational practices and the hiring of specialized mental health professionals. These programs should be supported by policy frameworks that promote regular assessments and adjustments based on emerging needs and challenges, ensuring that education remains adaptive and sensitive to the evolving landscape of the conflict in Ukraine.

## Conclusions

To summarize, we note that social inclusion and the creation of a barrier-free environment in Ukraine are traditionally considered in the context of policies regarding people with disabilities and representatives of low-mobility groups. In our opinion, a fundamental component in this process is also to ensure a policy of countering discrimination against minorities, achieving real equality of representatives of different groups in different spheres of socio-political and economic life. Integrated approaches to addressing societal constraints are components of diversity management processes and strategic community inclusion programs. This research has successfully identified and modeled the key educational factors that influence the development of inclusive social policies within school institutions in Ukraine. By employing graph theory and the connection graph method, we have pinpointed the two most significant factors that play a pivotal role in shaping inclusiveness. These findings provide a strong foundation for policymakers and educational leaders to design and implement effective strategies tailored to enhance inclusiveness in schools. Our study contributes to a deeper understanding of the interrelations among various educational elements and their collective impact on policy formation, offering a strategic approach to foster an inclusive educational environment.

To build upon the groundwork laid by this study, future research should extend the scope to include a broader range of educational institutions, particularly higher education and non-formal learning environments. Exploring how inclusiveness can be fostered across these varied settings will provide a more comprehensive view of the challenges and opportunities in developing inclusive educational policies. Additionally, subsequent studies could utilize longitudinal data to assess the long-term effects of implemented policies, thereby offering insights into their efficacy and sustainability. This extended research will be crucial for evolving the educational landscape to be truly inclusive and accommodating for all learners.

In the context of the ongoing war in Ukraine, the formulation of inclusive social policies for schools must prioritize adaptability and resilience. The study identifies crucial factors like accessibility and trauma-informed educational practices as central to fostering inclusiveness. Therefore, policy recommendations should focus on developing robust remote learning systems to ensure continuous access to education despite disruptions caused by the conflict. Additionally, integrating psychological support services within schools is essential to address the emotional and mental health challenges faced by students and staff. Training programs for educators should include modules on trauma awareness and coping mechanisms, equipping them to better support their students. These policies should be designed to be scalable and flexible, allowing for quick adjustments in response to changing circumstances due to the war. Moreover, collaboration with international educational and psychological experts can enhance the effectiveness of these initiatives, ensuring that they are informed by best practices in crisis education and mental health.

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## Enhancing spatial accessibility of tourist spots in Al Kharj city through space syntax analysis

تعزير إمكانية الوصول المكاني للمواقع السياحية في مدينة الخرج من خلال تحليل التركيب المكاني

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### Abstract

الملخص:

The tourism industry plays a pivotal role in the economic growth and cultural enrichment of cities. Urban regeneration has been considered as a key focus of urban tourism development. This study investigates the application of space syntax as an analytical and design tool in urban regeneration efforts, specifically focusing on Al Kharj City, Saudi Arabia, as a burgeoning tourist destination. The research aims to enhance the spatial accessibility of tourist spots in Al Kharj through space syntax analysis, addressing existing gaps in understanding and optimizing accessibility within the city. By integrating space syntax analysis into urban planning processes, this study seeks to inform stakeholders about the importance of spatial accessibility in enhancing the visitors' experience and fostering sustainable urban development. Through a multi-scale approach and advanced analytical techniques, the study provides insights into the complex relationships between spatial structures, economic activities, and functional distributions, offering recommendations for improving accessibility and optimizing the spatial distribution of tourist services in Al Kharj. Integrating spatial analysis into urban planning, enhancing connectivity and integration, promoting community involvement, addressing spatial disparities, and implementing evidence-based interventions could result in a more accessible and inclusive urban environment for the enhancement of urban tourism.

تلعب صناعة السياحة دورًا محوريًا في النمو الاقتصادي والإثراء الثقافي للمدن. يعتبر التجديد الحضري محورًا رئيسيًا لتنمية السياحة الحضرية. تبحث هذه الدراسة في تطبيق بناء تركيب الفضاء كأداة تحليلية وتصميمية في جهود التجديد الحضري، مع التركيز بشكل خاص على مدينة الخرج، المملكة العربية السعودية، كوجهة سياحية مزدهرة. ويهدف البحث إلى تعزيز إمكانية الوصول المكاني للمواقع السياحية في الخرج من خلال تحليل الفضاء، ومعالجة الفجوات الموجودة في الفهم وتحسين إمكانية الوصول داخل المدينة. من خلال دمج تحليل تركيب الفضاء في عمليات التخطيط الحضري، تسعى هذه الدراسة إلى إعلام أصحاب المصلحة بأهمية إمكانية الوصول المكاني في تعزيز تجربة الزوار وتعزيز التنمية الحضرية المستدامة. ومن خلال نهج متعدد النطاق وتقنيات تحليلية متقدمة، تقدم الدراسة رؤى حول العلاقات المعقدة بين الهياكل المكانية والأنشطة الاقتصادية والتوزيعات الوظيفية، وتقدم توصيات لتحسين إمكانية الوصول وتحسين التوزيع المكاني للخدمات السياحية في الخرج. إن دمج التحليل المكاني في التخطيط الحضري، وتعزيز الاتصال والتكامل، وتشجيع مشاركة المجتمع، ومعالجة التفاوتات المكانية، وتنفيذ التدخلات القائمة على الأدلة يمكن أن يؤدي إلى بيئة حضرية أكثر سهولة وشمولاً لتعزيز السياحة الحضرية.

**Keywords:** Tourist Spots, Spatial Accessibility, Space Syntax analysis, Al Kharj City, Saudi Arabia.

**الكلمات المفتاحية:** المواقع السياحية، إمكانية الوصول المكاني، تحليل الفضاء، مدينة الخرج، المملكة العربية السعودية.

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## Introduction

The tourism industry is a significant driver of economic growth and cultural exchange, contributing to the development of cities worldwide. Within the realm of urban tourism, urban regeneration has emerged as a prominent focus of numerous urban development projects. This study explores the utilization of space syntax theory as both an analytical and design tool in the context of urban regeneration efforts. Al Kharj, a rapidly growing city in Saudi Arabia, is poised to become a prominent tourist destination due to its historical significance, cultural heritage, and natural attractions. However, the spatial organization and accessibility of tourist spots within the city need to be critically examined to optimize the visitor experience. This research proposal aims to investigate and enhance the spatial accessibility of tourist spots in Al Kharj City through the application of Space Syntax analysis.

The tourism industry in Al Kharj City, Saudi Arabia, is experiencing significant growth and development. However, the spatial accessibility of tourist spots within the city has not been thoroughly analyzed, potentially leading to suboptimal visitor experiences and limited economic benefits. Existing research has explored the use of GIS and in assessing spatial accessibility in various urban contexts, including tourist destinations (Abdelkarim et al., 2022; Alawer, 2018). Moreover, research has also explored the factors influencing shopping malls attractiveness and their impact on shoppers' satisfaction in Saudi Arabia (Al-Medabesh & Ali, 2016). To fill the gap in understanding tourist spot accessibility in Al Kharj City, this study proposes the use of Space Syntax analysis. This tool will allow for a comprehensive assessment of the spatial distribution and organization of tourist spots, as well as identifying accessibility patterns (Shvets et al., 2015). By analyzing the connectivity, integration, and mean depth of spaces, this research aims to provide valuable insights into the current spatial layout configuration and user behavior within these tourist spots. The findings of this study will not only contribute to the knowledge and understanding of tourist spot accessibility in Al Kharj City but also provide practical recommendations for optimizing accessibility and enhancing the overall visitor experience. Moreover, the research aims to inform urban planners, local authorities, and tourism agencies about the importance of considering spatial accessibility in their development plans and strategies. By integrating space syntax analysis

into the planning and design process, these stakeholders can identify potential barriers to accessibility and implement measures to improve connectivity between tourist spots.

Urban tourism and its related elements constitute a burgeoning field of study, with researchers such as Ashworth & Page (2011) and Miller, Merrilees, & Coghlan (2015) shedding light on its complexities. Policy makers, researchers, and practitioners are increasingly striving to gain a deeper understanding of tourism within urban areas (Edwards, Griffin, & Hayllar, 2008). Urban tourism emerged as a distinct and significant research area in the 1990s, following earlier studies in the 1960s which were limited in scope (Pearce, 2001). Lapko (2014) notes its pivotal role as a primary function of cities, particularly evident in the appeal of city centers to both international and local visitors.

City centers, with their diverse attractions and focused locations, offer unique opportunities for visitors seeking social or institutional engagements, whether for business, leisure, or personal reasons (Vandermeij, 1984). The potential of urban tourism to facilitate connections between people, cultures, and consumption experiences fosters an exciting exploration for visitors (Edwards, Griffin, & Hayllar, 2008).

Originating in Britain as resort morphology, the study delves into the relationship between urban tourism and urban morphology, as proposed by Gilbert (1949) and expanded upon by Ashworth (1989). Ashworth outlined four approaches to understanding urban tourism, emphasizing spatial analysis, ecological considerations, user perspectives, and policy implications. Gospodini (2001) explored how urban morphology, encompassing spatial and formal patterns, influences urban tourism. Despite some documentation of spatial aspects in urban tourism literature, there remains a dearth of studies examining the relationship between urban tourism and the spatial and formal dimensions of urban environments—urban space morphology—particularly in research since 2001. This study aims to analyze the existing spatial structure of Al Kharj City, KSA for the enhancement of spatial accessibility of tourist spots through space syntax analysis, addressing existing gaps in understanding and optimizing accessibility. The Specific objectives include:

- To assess the spatial distribution of tourist spots in Al Kharj City.
- To analyze the spatial configuration and organization of tourist spots in Al Kharj City using Space Syntax methodology.
- To identify spatial patterns and connections that influence the accessibility of tourist destinations.
- To identify potential barriers or challenges affecting spatial accessibility.
- To propose recommendations for optimizing the spatial organization to improve tourist spot accessibility in Al Kharj City.

## Literature Review

Tourism has emerged as a significant contributor to economic growth, cultural exchange, and social development globally (Telfer & Sharpley, 2015). As cities strive to leverage their tourism potential, understanding the spatial accessibility of tourist destinations becomes crucial for sustainable development and effective planning (Della et al., 2017). The tourism industry has gained increasing attention due to its potential to stimulate economic growth, generate employment opportunities, and foster cultural exchange. Numerous studies have highlighted the positive impact of tourism on local economies (Dwyer et al., 2019). In rapidly developing cities like Al Kharj, Saudi Arabia, tourism serves as a catalyst for economic diversification and urban development (Sharpley, 2002). Consequently, understanding the spatial distribution and accessibility of tourist spots is crucial for optimizing tourism-related infrastructure and enhancing the visitor experience.

Spatial accessibility refers to the ease with which individuals can reach various destinations within a geographical area. In the context of tourism, spatial accessibility plays a critical role in determining the attractiveness and competitiveness of destinations (Li et al., 2019). Studies have shown that improving spatial accessibility to tourist attractions can increase visitor numbers, prolong stay durations, and enhance overall satisfaction (Mohammed et al., 2024; Mao et al., 2021). Therefore, assessing and enhancing spatial accessibility have become key priorities for destination management organizations and urban planners.

Since the mid-1980s, tourism has increasingly become a significant aspect of urban economies, often playing a central role in urban regeneration projects (Hall & Page, 2009). Owens (2008) examines the role of tourism in urban

regeneration through case studies, highlighting its potential to drive fundamental changes in urban areas undergoing transition. Urban regeneration, particularly in relation to tourism, has been a focus of research, with urban tourism research identifying urban regeneration as a primary sub-theme (Ashworth & Page, 2011).

City morphology and accessibility are crucial factors in urban tourism (Gospodini, 2001; Safari & Moridani, 2017), with accessibility deemed essential for tourists (Toth & David, 2010). Wayfinding, defined as purposeful movement to a specific destination, is another key consideration for urban visitors (Golledge, 1999).

Various urban theories have been proposed to assist urban tourism and regeneration, including the analytical method theory (Collins et al., 2006; Welter & Whyte, 2003). Space syntax, a methodology proposed for urban design, offers an analytical framework connecting urban space with people's behavior and addressing accessibility and wayfinding concerns (Karimi, 2016). Studies have shown that space syntax can influence people's behavior and wayfinding in urban spaces (Hillier, 2007; Dalton, 2003), making it a valuable tool for improving urban tourism accessibility. Liu et al., (2018), found that the distribution of scenic spots has a significant impact on tourist flow and visitors' choices of entrance to the mountain; the volume of online sign-ins is highly correlated with landscape attention, axial control values and the local integration value of the trails.

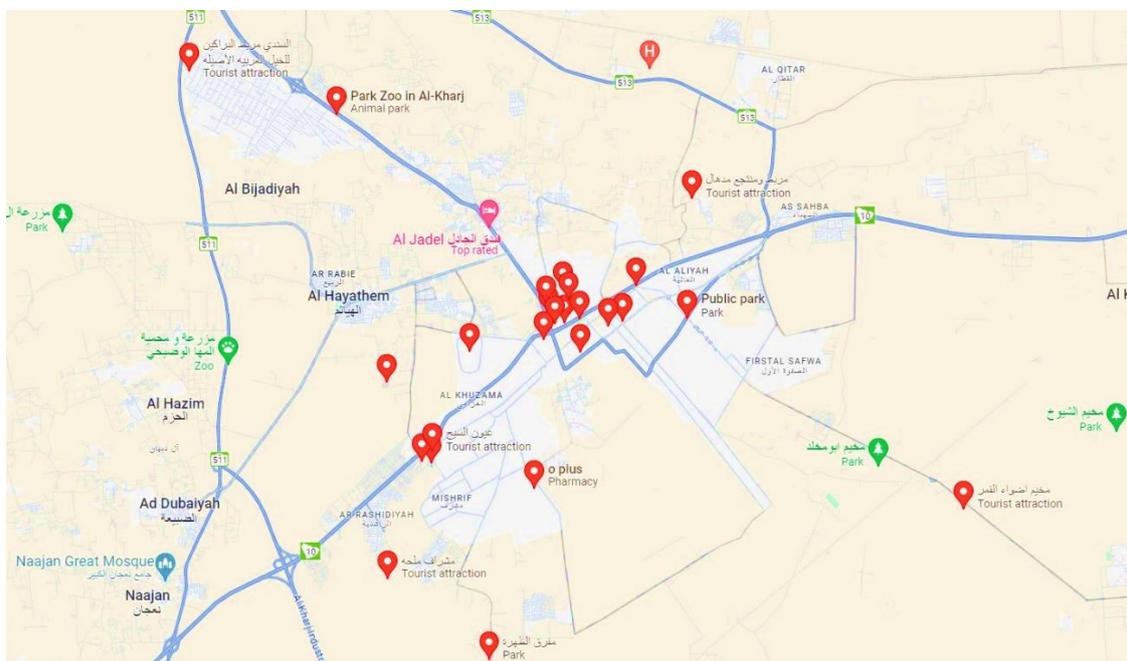
Space Syntax analysis offers a theoretical framework and analytical tools for understanding the spatial configuration of urban environments (Hillier & Hanson, 1989). By examining the connectivity and integration of streets and spaces, Space Syntax analysis helps identify spatial hierarchies, patterns of movement, and points of attraction within cities (Penn et al., 1998). In the context of tourism, Space Syntax analysis can provide valuable insights into the accessibility and visibility of tourist destinations (Giseop et al., 2019). By assessing the spatial layout and connectivity of urban spaces, Space Syntax analysis informs decision-making processes aimed at enhancing the pedestrian experience and optimizing urban design.

In rapidly developing countries like, Malaysia (Safari et al., 2018; Safari & Moridani, 2017; Mansouri & Ujang, 2017), India (Chakravarty, 2023), China (Qin et al., 2023; Wang et al., 2022; Zuo et al., 2021; Li, et al., 2016), UAE (Kubat, et al., 2012) and Qatar (Mansour et al., 2022;

Tannous et al., 2021); space syntax tools and methodologies are being used for the understanding and enhancement of tourism. There remains a dearth of research, particularly in the context of rapidly developing cities such as Al Kharj, Saudi Arabia about the application of space syntax and tourism.

The literature review emphasizes that tourism is crucial for global economic growth, cultural exchange, and social development. Understanding the spatial accessibility of tourist destinations is vital for sustainable development and strategic planning. Tourism significantly stimulates economic growth, creates jobs, and promotes cultural exchange, especially in rapidly developing cities like Al Kharj, Saudi Arabia,

where it aids economic diversification and urban development. Enhancing spatial accessibility, which influences the attractiveness and competitiveness of tourist spots, is essential for optimizing tourism infrastructure and improving visitor experiences. Research shows that better spatial accessibility increases visitor numbers, extends stays, and improves satisfaction. Urban regeneration, often driven by tourism, has been a key research area, focusing on how urban morphology and accessibility affect tourism. Space Syntax analysis, which studies urban space connectivity and integration, offers insights into urban design and tourism accessibility. However, there's limited research on applying Space Syntax in cities like Al Kharj to boost tourism development.



**Fig. 1.** Map of the study area, Al Kharj KSA.  
Source: Google map

## Materials and Methods

This research is based on case studies and combined strategies method. The Map Al Kharj, KSA with immediate surroundings was analyzed through depthmapX, space syntax software. The measures of integration, step depth, choice, and connectivity values were calculated. In an urban layout, an axial line surrounds every block and every street node is considered an intersection of an axial line. Therefore, the axial configuration is regarded as an objective record of the urban grid structure. The most significant measure of an axial map is integration, which measures how deep each location is to all others. Well-integrated locations are colored red, while the

poorly integrated ones are blue.

The theory of natural movement (Hillier et al., 1993), states that integrated spaces play a significant role in the urban environment. These integrated spaces are not only frequently used or visited but also better known because of their suitable location within the people's daily movement pattern (Stähle, 2005). The integration values are ranked from most integrated to segregated to indicate how easily one can reach a specific street or a line on the axial map. The number of alternative visible routes a public space offers from one point to another is defined as the permeability of that space (Alcock, 1987). The choice value (global measure) and

connectivity (local measure) of each link determine the entry points for stability between the city-wide and local scale accessibility.

#### Study Area and tourist attractions:

Al Kharj, situated within the Riyadh Province in the heart of Saudi Arabia, stands as a testament to the nation's rich heritage, blending agricultural prowess with a significant military presence. Historically, this region has served as a vital waypoint owing to its strategic location and ample water resources, offering respite to traders and travelers traversing its arid landscapes.

In modern times, Al Kharj has evolved into a hub of agricultural innovation, boasting expansive farms and flourishing date palm plantations. Its fertile soils, coupled with favorable climatic conditions, provide an ideal environment for cultivating a variety of crops, from succulent dates to nutritious vegetables and grains. Embracing modern farming techniques and sophisticated irrigation systems, Al Kharj epitomizes agricultural excellence in the region.

Beyond its agricultural endeavors, Al Kharj caters to the diverse needs of its residents and visitors alike, offering a range of amenities such as educational institutions, healthcare facilities, shopping centers, and recreational spaces.

#### Tourist Places in Al Kharj:

Amidst its agricultural and military prominence, Al Kharj conceals a treasure trove of natural wonders and cultural landmarks, beckoning travelers to explore its hidden gems. From historic edifices like the iconic King Abdulaziz Palace to captivating natural attractions such as Ayun Al Seih and Al Heet Cave, the city promises an enriching experience for discerning adventurers.

One of the notable attractions in Al Kharj is the Al Kharj Zoo, nestled along the Riyadh-Al Kharj highway. Home to a diverse array of animals, birds, and reptiles, the zoo offers a captivating glimpse into the kingdom's rich biodiversity. Visitors can also bask in the serene ambiance of lush greenery within the zoo premises, providing a tranquil retreat from the bustling city life.

For aficionados of history and culture, the Al Kharj Museum serves as a repository of artifacts and exhibits, offering insight into the city's illustrious past. Meanwhile, nature enthusiasts can immerse themselves in the scenic beauty of Wadi Hanifah, a verdant valley adorned with

parks, walking trails, and cycling tracks, offering respite amidst nature's embrace.

Adventurous souls can embark on a journey to explore the ancient fortifications of Al Kharj Castle, steeped in centuries-old history and architectural grandeur. Alternatively, visitors can marvel at the natural wonders of Ayun Al Seih, once teeming with cool, crystalline waters that beckoned travelers from far and wide.

In addition to these attractions, Al Kharj boasts modern recreational facilities such as the Al Baijan Amusement Park and the King Salman Walkway, catering to the leisure needs of visitors of all ages. Moreover, culinary enthusiasts can savor a panoramic view of the city from the Al Kharj Water Tower while indulging in a romantic dinner under the starlit sky.

In essence, Al Kharj epitomizes the harmonious blend of tradition and modernity, offering a myriad of experiences for intrepid travelers. Whether exploring its ancient heritage or basking in the tranquility of its natural landscapes, visitors to Al Kharj are sure to be captivated by the city's timeless allure. With its diverse array of tourist attractions and warm hospitality, Al Kharj beckons travelers to embark on a journey of discovery and enlightenment amidst the splendor of Saudi Arabia's heartland.

#### Analysis

The study examined the tourist attractions of Al Kharj, Saudi Arabia. It assessed various factors including accessibility, integration, step depth, choice, connectivity, and accessibility ratings using space syntax analysis.

Integration measures the connection between a park and its surroundings, with values closer to 1 indicating high integration and values below 1 indicating segregation. Step depth refers to the number of typological steps required to access a specific location, with lower values indicating easier accessibility.

Choice evaluates the likelihood of traversing an axial line or street segment along the shortest routes between spaces in the system or within a predetermined radius. Connectivity measures the number of connections between the park and its surrounding areas.

The concept of accessibility, essential in physical and urban planning, has been defined and explored in various studies (Chen & Yeh, 2019; Geurs & van Wee, 2004; Handy & Niemeier,

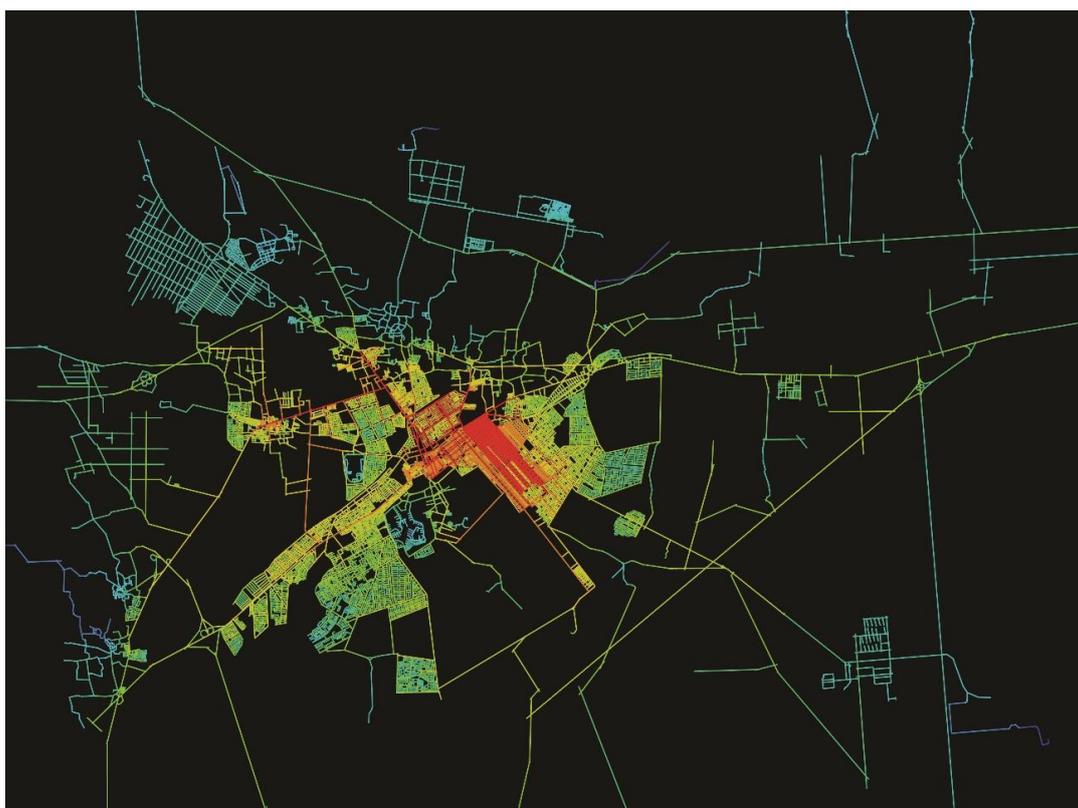
1997; Hansen, 1959; Markovich, 2013). It encompasses the relative proximity of places and persons, including opportunities and activities, with profound implications for functional, economic, and social aspects (Erkut & Özgen, 2003). Road networks serve as fundamental elements facilitating accessibility across different scales, from neighborhood to national levels (Parham et al., 2017; Serra & Pinho, 2013).

Cities are integral components of regional and national systems, influencing their functional potential (Law & Versluis, 2015; Serra, Hillier, & Karimi, 2015). Economic theories dating back to the mid-19th century have emphasized the spatial organization of economic activity, highlighting the significance of accessibility and proximity to populated centers (Portugali, 2011). While traditional studies lacked resolution and comprehensive data, modern Geographic Information (GI) technologies enable detailed analyses of accessibility at national scales (Law & Versluis, 2015; Serra et al., 2015).

Recent studies have explored accessibility at

unprecedented national scales, leveraging advanced methodologies such as Space Syntax analysis (Law & Versluis, 2015; Serra et al., 2015). However, these analyses have primarily focused on specific countries, such as the United Kingdom, overlooking transitions between functional systems across different scales. It is suggested that economic activities shape national spaces into core and peripheral regions, influencing population distribution and economic activity. Yet, the dichotomy between core and periphery may oversimplify the spatial structure, as multiple economic concentrations and functional attractors may exist (Krugman, 1999).

To address these complexities, a multi-scale approach to accessibility analysis is proposed, integrating network analysis methodologies with functional indicators (Law & Versluis, 2015; Serra et al., 2015). This approach considers spatial accessibility's correlation with various socio-economic factors across different scales, revealing intricate relationships between spatial structures and functional distributions.



**Fig. 2.** Integration Map, Al Kharj KSA.

Source: Author.

**Table 1.**  
*Summary of Integration values of Al kharj*

AVG.	Min	Max	Std. Dv	Count	Less than 0.30	0.30-0.38	0.38-0.46	0.46-0.54	0.54-0.62	0.62-0.69	0.69-0.77	0.77-0.85	0.85-0.93	Above 0.93
0.65	0.22	1.01	0.13	9431	45	143	724	1044	1901	2329	1710	1010	455	70

Source: Author

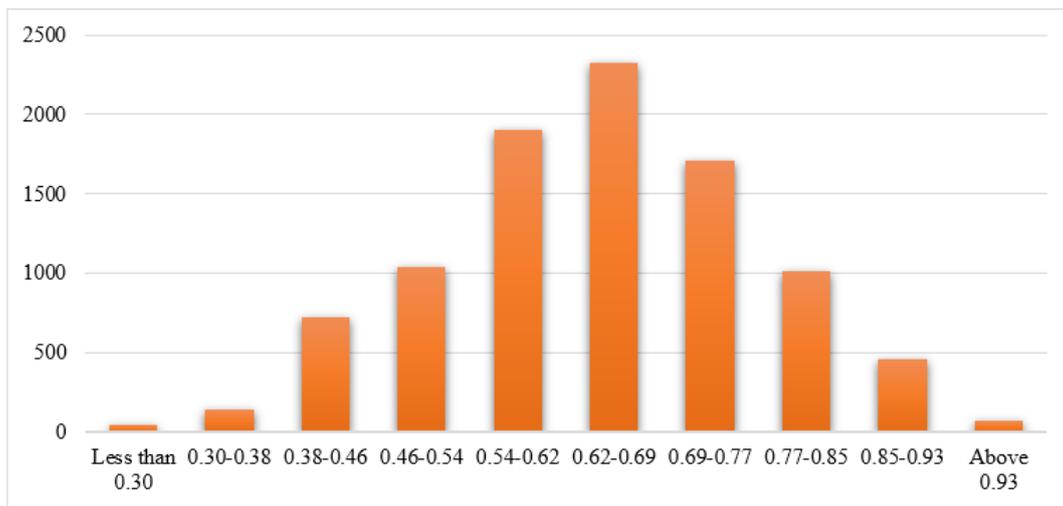
The integration value above 1 shows strong integration, while the value below 1 indicates segregation. In the case of Al Kharj City Highest integration of 1.01 was observed. The mean integration for the study area is 0.65 and minimum is 0.22 as shown in table 1.

The heat scale shows the highest values as red, then orange, followed by yellow, and then green, i.e., the highest values colored in hot, and as the value decreases the color becomes cooler.

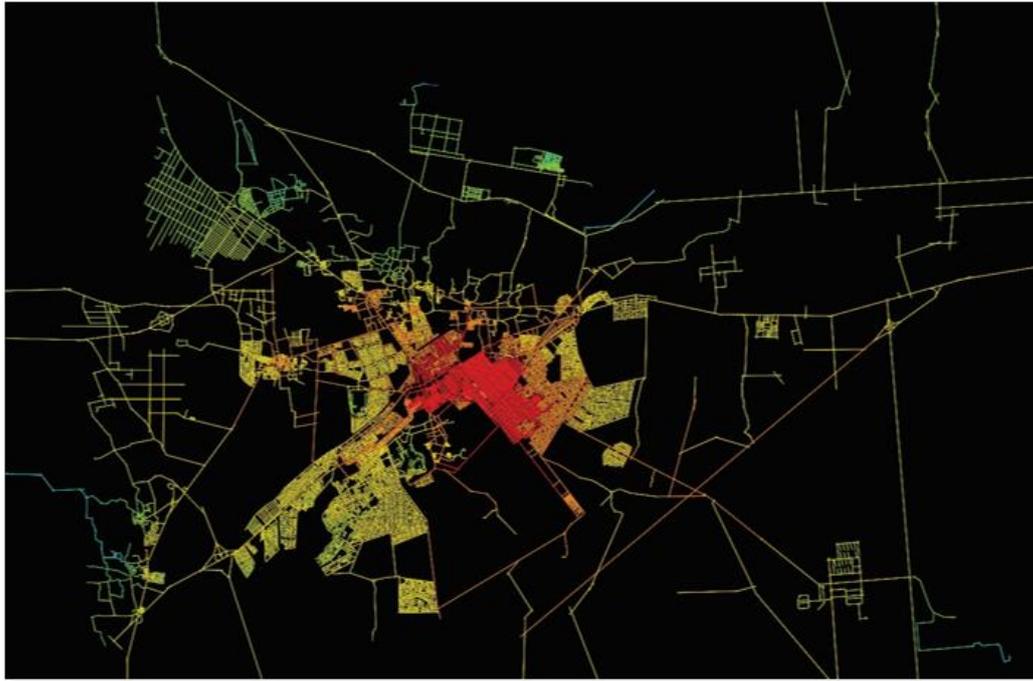
**Results**

Figure 1 illustrates the map of Al Kharj

pinpointing its tourist attractions. These attractions exhibit a centralized spatial distribution. The map underwent digitization using AutoCAD software, as well as GIS. Subsequently, the author employed Depthmap X software to conduct axial analysis, resulting in the creation of an axial map. Figure 2 depicts the integration of Al Kharj as analyzed by Depthmap. The average integration was determined to be 0.65, with the highest recorded value being 1.01 and the lowest 0.22 for Al Kharj. Additionally, the difference factor for these integration values was computed as 0.65, indicating significant disparities among various movement routes, as detailed in Figure 3 and Table 1.



**Fig. 3.** Distribution of integration, Al Kharj KSA.  
Source: Author



**Fig. 4.** Step depth from the most integrated routes.

Source: Author

**Table 2.**

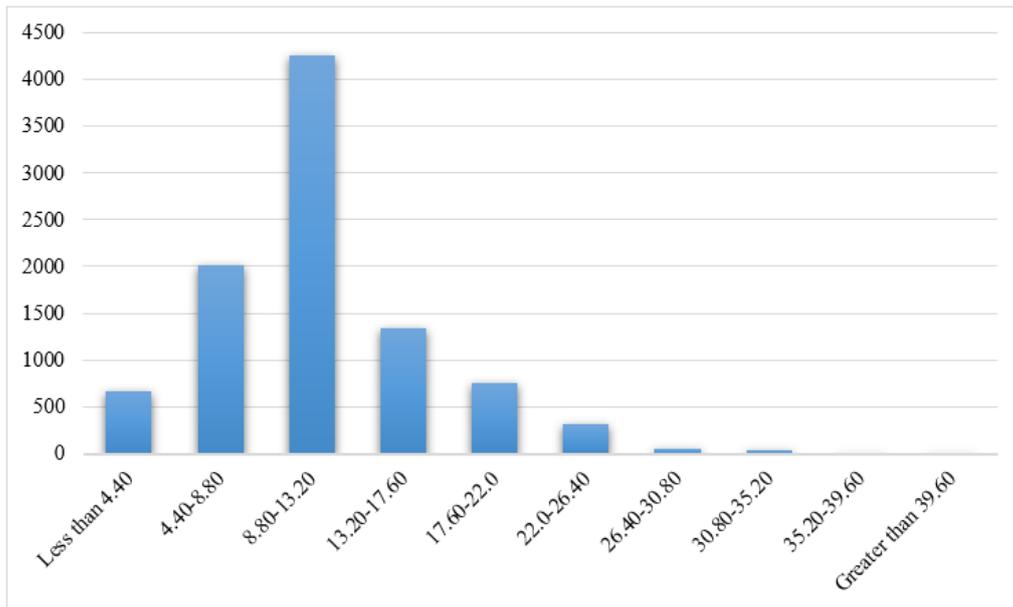
*Summary of Step depth values of Al Kharj.*

AVG.	Min	Max	Std. Dv	Count	Less than 4.40	4.40-8.80	8.80-13.20	13.20-17.60	17.60-22.0	22.0-26.40	26.40-30.80	30.80-35.20	35.20-39.60	Greater than 39.60
11.48	0	44	5.23	9431	661	2016	4246	1338	751	314	51	37	9	8

Source: Author

The most integrated routes were found in the central park of the city, where most of the tourist spots are located. The central area of Al-Kharj City, particularly in the Al-Salam and Al-Wurud neighborhoods, exhibits a notable concentration of parks, with a density exceeding 0.47 parks per square kilometer. In the Tawiq and Mushrif neighborhoods, park density ranges from 0.24 to

0.46 parks per square kilometer. Conversely, park density in the Al-Afja neighborhood varies from 0.04 to 0.05 parks per square kilometer. As one moves away from the center of Al-Kharj, the density of parks gradually decreases, reaching its lowest levels in the northeast, east, south, and southwest areas of the city, with densities falling below 0.003 parks per square kilometer.



**Fig. 5.** Distribution of Step Depth.  
Source: Author

The distribution of parks primarily in the central area of Al-Kharj City significantly influences access times to these recreational spaces. The range of access times varies considerably, with the shortest recorded time being less than 0.16 minutes and the longest reaching 56.3 minutes. Notably, neighborhoods such as Al-Salam, Al-Aaliyah, and Al-Faisal enjoy swift access to parks, with times of less than 3 minutes. Conversely, on the city's outskirts, neighborhoods like Al-Sahba, Al-Basatin, and

Mushrifah exhibit access times ranging from 8 to 9 minutes. However, in the eastern and southern sectors of the city, including Al-Rihan, Najd, Ahad, Al-Arid, and Al-Narjis neighborhoods, access times increase substantially to approximately 15–22 minutes. The highest access times were observed in the southern and southeastern regions of Al-Kharj City, particularly in neighborhoods such as Al-Sharq, Al-Naseem, Al-Waha, and Al-Rahab.



**Fig. 6.** Choice Map.  
Source: Author.

**Table 3.**  
*Summary of Choice values of Al kharj*

AVG.	Min	Max	Std. Dv	Count	Less than 0.072	0.072-0.145	0.145-0.218	0.218-0.290	0.290-0.363	0.363-0.436	0.436-0.509	0.509-0.581	0.581-0.654	Greater than 0.654
0.004	0	0.73	0.019	9431	9343	53	21	7	5	0	0	0	0	2

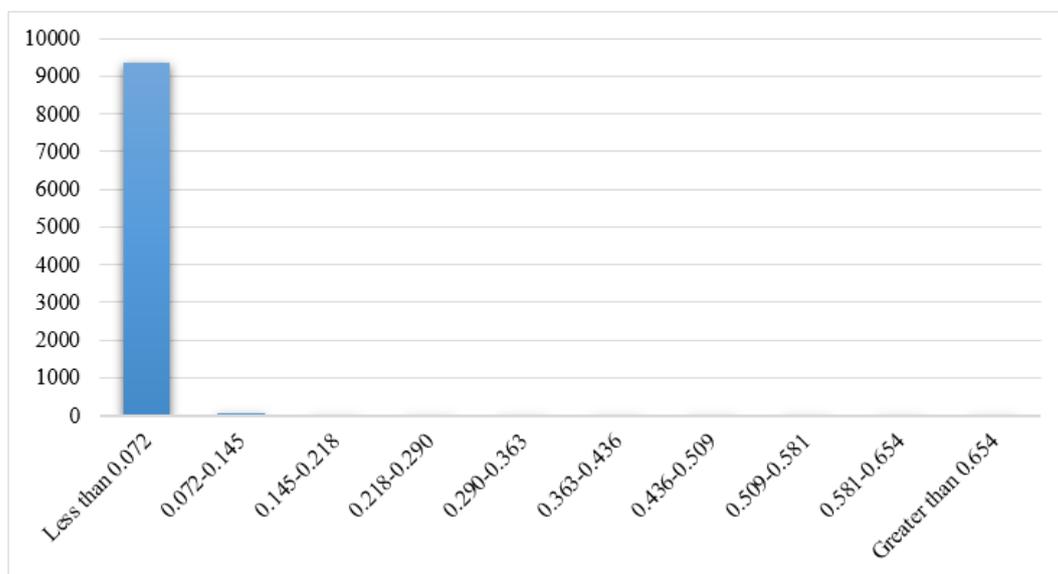
Source: Author

Al Kharj exhibited a maximum step depth of 44, with an average step depth calculated at 11.48. This indicates that, on average, navigation within the city requires approximately 11.48 or 12 turns. Figure 5 displays the distribution of step depth, highlighting a greater frequency of routes with step depths of less than 9. Further details are presented in Table 2.

Figure 6 depicts the choice map of Al Kharj, with the highest choice value recorded at 0.73 and the

lowest at 0. The average choice value for Al Kharj was determined to be 0.004. Meanwhile, Figure 7 illustrates the distribution of choice values, indicating that the majority of routes possess choice values below 0.072.

The distance to tourist spots in Al-Kharj spans from a maximum of 64.4 kilometers to a minimum of less than a quarter kilometer. Conversely, the longest recorded travel time to residential centers stands at 86.3 minutes.



**Fig. 7.** Distribution of Choice values.  
Source: Author.

Notably, restaurants and cafes are predominantly concentrated in the central area of Al-Kharj, resulting in relatively short travel times, with durations of less than one minute (3 minutes) in neighborhoods such as Al-Wurud, Al-Salam, Al-Nasifa, Al-Faisalía, and Al-Khalidiya.

Conversely, in the western outskirts, travel times to these amenities slightly increase, ranging from 6.6 to 9.9 minutes in neighborhoods like Al-Rafaia and Al-Rafi, situated northwest of the study area, as well as in Al-neighborhood.



**Fig. 8.** Connectivity map of Al Kharj City.  
Source: Author.

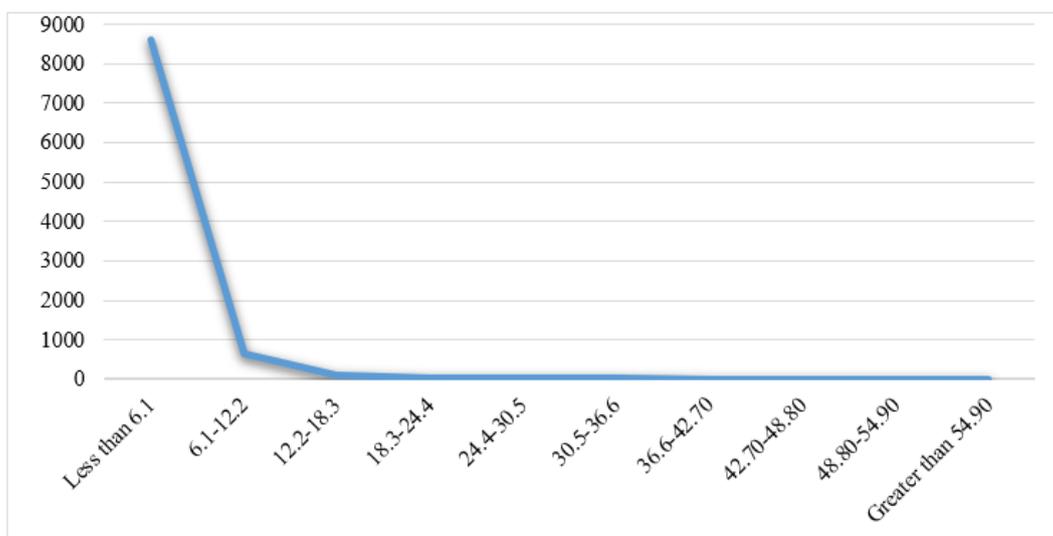
**Table 4.**  
*Summary of Connectivity values of Al kharj*

AVG.	Min	Max	Std. Dv	Count	Less than 6.1	6.1-12.2	12.2-18.3	18.3-24.4	24.4-30.5	30.5-36.6	36.6-42.70	42.70-48.80	48.80-54.90	Greater than 54.90
3.61	0	61	3.57	9435	8614	628	94	27	21	34	10	6	0	1

Source: Author

Moving towards the northern, northeastern, and southern parts of the central area, travel times to reach restaurants and cafes extend to approximately a quarter of an hour (14.9–22.3 minutes). Further east and south, these travel times increase, reaching around half an hour

(22.3–30 minutes) in neighborhoods such as Al-Rayah and Al-Qairawan. Finally, in the southernmost and easternmost regions of the study area, travel times exceed half an hour (30 minutes) in neighborhoods like Al-Rahab, Al-Naseem, Al-Waha, Al-Nakhl, and Al-Sharq.



**Fig. 9.** Distribution of Choice Values.

Source: Author.

Figure 8 presents the connectivity analysis of Al Kharj, Kingdom of Saudi Arabia (KSA). The average connectivity was computed to be 3.61, with the highest value reaching 61, denoted by red lines on the connectivity map, representing the intensity through a heat scale. Conversely, the lowest connectivity value was recorded at 0, indicated by purple lines in Figure 8's connectivity map. These values are further detailed in Table 4. Figure 9 illustrates the distribution of connectivity values for Al Kharj KSA, revealing that 8614 routes have connectivity values less than 6.1.

## Discussion

The study delved into an extensive examination of Al Kharj's tourist attractions in Saudi Arabia, employing a multifaceted analysis that encompassed various factors including accessibility, integration, step depth, choice, and connectivity, utilizing space syntax analysis. Accessibility, a cornerstone in physical and urban planning, has garnered significant attention in scholarly discourse due to its implications for functional, economic, and social aspects (Chen & Yeh, 2019; Geurs & van Wee, 2004; Handy & Niemeier, 1997; Hansen, 1959; Markovich, 2013). The intricate interplay between accessibility and spatial structures has been a subject of interest, particularly concerning road networks that serve as fundamental conduits facilitating mobility across different spatial scales, ranging from neighborhoods to national levels (Parham, Law, & Versluis, 2017; Serra & Pinho, 2013).

Cities, as pivotal components of regional and national systems, exert considerable influence on functional dynamics and economic potentials, shaping population distribution and economic activities (Law & Versluis, 2015; Serra, Hillier, & Karimi, 2015; Portugali, 2011). However, conventional studies often lacked the depth and comprehensive data to unravel the intricate spatial patterns. With the advent of modern Geographic Information (GI) technologies, particularly Geographic Information Systems (GIS), scholars have been empowered to conduct detailed accessibility analyses at national scales, facilitating nuanced insights into spatial distributions and dynamics (Law & Versluis, 2015; Parham et al., 2017; Serra et al., 2015).

Recent studies have ventured into exploring accessibility on unprecedented national scales, leveraging advanced methodologies such as Space Syntax analysis. However, these analyses have predominantly focused on specific countries, potentially overlooking the transitions between functional systems across different scales (Law & Versluis, 2015; Serra et al., 2015). It's acknowledged that economic activities play a pivotal role in shaping national spaces, often manifesting in core-periphery dynamics that influence population distribution and economic activities (Krugman, 1999). However, the oversimplification inherent in the core-periphery dichotomy fails to capture the complexity of spatial structures, as multiple economic concentrations and functional attractors may coexist within a region.

To address these complexities, the study proposes a multi-scale approach to accessibility

analysis, integrating network analysis methodologies with functional indicators, allowing for a nuanced examination of the correlation between spatial accessibility and various socio-economic factors across different scales, thereby revealing intricate relationships between spatial structures and functional distributions. The integration values obtained indicate strong connectivity within Al Kharj, particularly highlighted by the highest integration value of 1.01. This indicates a robust connection between the parks and their surroundings, signifying high integration. Conversely, values below 1 suggest segregation.

The distribution of tourist attractions within Al Kharj displays a centralized spatial pattern, notably concentrated in the central area, particularly in neighborhoods like Al-Salam, Al-Wurud, Al-Nasifa, Al-Faisalia, and Al-Khalidiya. Accessibility to these attractions varies across different regions of the city, with travel times extending from mere minutes to over half an hour, influenced by factors such as park density and spatial connectivity. The connectivity analysis further highlights spatial disparities, with central areas exhibiting higher connectivity compared to peripheral regions.

## Conclusions

In conclusion, the comprehensive analysis of Al Kharj's tourist attractions offers valuable insights into the spatial dynamics of the city, emphasizing the importance of accessibility in shaping urban landscapes. By adopting a multi-scale approach and integrating advanced analytical techniques, the study provides a nuanced understanding of the intricate relationships between spatial structures, economic activities, and functional distributions, thereby informing more effective urban planning strategies aimed at enhancing accessibility and optimizing the spatial distribution of tourist services within Al Kharj. This study sheds light on the complex interplay between spatial configuration and park accessibility in urban environments. Through a comprehensive analysis incorporating space syntax techniques and user feedback, the research identified key spatial attributes influencing accessibility in Al Kharj, KSA.

The results highlight how crucial it is to carefully consider spatial integration, choice, and connectivity when to improve accessibility and utilization. Nevertheless, the research also uncovered disparities between objective geographical metrics and subjective user assessments of accessibility, highlighting the

necessity of a comprehensive strategy that incorporates both quantitative spatial analysis and qualitative user input in design and administration.

In order to improve accessibility, encourage community involvement, and promote well-being in urban settings, evidence-based interventions can be informed by addressing these gaps and utilizing spatial insights.

Despite the comprehensive nature of this study, several limitations should be acknowledged. Firstly, the geographical scope of the study, which is focused solely on Al Kharj, Saudi Arabia. While this focus provides detailed insights into this specific urban context, it limits the generalizability of the findings to other cities with different socio-economic, cultural, and spatial characteristics. Future research could benefit from comparative studies across diverse urban environments to validate and extend the applicability of the findings.

Secondly, the integration of advanced analytical techniques enriches the study, the complexity and technical nature of these methods might limit their accessibility to urban planners and policymakers who may lack specialized training. Therefore, intuitional trainings and education of the same is recommended for future work and applications.

The comprehensive analysis of Al Kharj's tourist attractions offers valuable insights into the spatial dynamics of the city, emphasizing the importance of accessibility in shaping urban landscapes. By adopting a multi-scale approach and integrating advanced analytical techniques, the study provides a nuanced understanding of the intricate relationships between spatial structures, economic activities, and functional distributions. This knowledge informs more effective urban planning strategies aimed at enhancing accessibility and optimizing the spatial distribution of tourist services within Al Kharj. The study highlights the complex interplay between spatial configuration and accessibility in urban environments, underscoring the importance of considering both quantitative spatial analysis and qualitative user input in urban design and management. Addressing these limitations and leveraging spatial insights can inform evidence-based interventions to improve accessibility, foster community engagement, and enhance well-being in urban settings.

## Recommendations

Based on the comprehensive analysis conducted in this study, several recommendations emerge for improving accessibility and optimizing the spatial distribution of tourist services within Al Kharj:

**Integrate Spatial Analysis into Urban Planning:** Incorporate spatial analysis, particularly space syntax techniques, into urban planning processes to enhance the understanding of spatial dynamics and optimize the layout of tourist attractions and amenities within the city.

**Consider Multiscale Approach:** Adopt a multiscale approach to accessibility analysis, integrating network analysis methodologies with functional indicators, to capture the intricate relationships between spatial structures, economic activities, and functional distributions across different scales.

**Enhance Connectivity and Integration:** Focus on enhancing connectivity and integration within Al Kharj by investing in infrastructure development, improving road networks, and creating pedestrian-friendly environments to facilitate seamless movement between tourist attractions and amenities.

**Promote Community Involvement:** Encourage community involvement in urban planning processes to ensure that the spatial layout of tourist services aligns with the needs and preferences of residents and visitors. Solicit user feedback to supplement quantitative spatial analysis and inform decision-making.

**Address Disparities:** Address spatial disparities in accessibility by targeting interventions in areas with lower connectivity and integration, particularly peripheral regions of the city. Implement measures to improve access to tourist attractions and amenities in these areas to promote inclusivity and equitable access for all residents.

**Utilize Evidence-Based Interventions:** Implement evidence-based interventions informed by spatial insights and user feedback to enhance accessibility, encourage community engagement, and promote well-being in urban settings. This may include targeted investments in infrastructure, public transportation, and green spaces to improve overall accessibility and quality of life.

By implementing these recommendations, urban planners and policymakers can work towards creating a more accessible, inclusive, and vibrant urban environment in Al Kharj, Saudi Arabia, thereby enhancing the overall tourist experience and contributing to the city's socio-economic development.

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## Enhancing Architectural Space through AI-Driven Ideation: A Case Study of Future Iranian-Traditional City

### Yapay Zeka Odaklı Fikir Yoluyla Mimari Mekanın Geliştirilmesi: Geleceğin İran-Geleneksel Şehri Üzerine Bir Örnek Olay İncelemesi

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#### Abstract

Artificial intelligence is an evolving technology that has drawn huge economic and social, educational benefits for the future. The revolutionary potential of this technology is boundless, as it can transform how humans live, work, learn, discover, and interact with each other. This research aims to investigate the theoretical foundations of environmental psychology, identify the characteristics of the appropriate architectural space, and then investigate the effect of using artificial intelligence in creating the appropriate architectural space from a formal aspect. The research method is descriptive-analytical and of a qualitative type, which was done by studying library sources and then logically analyzing the data. The research tool is artificial intelligence Midjourney and Dall.e3, which has been introduced for some time in creating artistic images from input words, and prompts. It has been the focus of various artists and architects. It can be said that with architectural conceptual plans, the future will become a reality differently, and they can positively influence the creativity of architects and create futures that most people will not think of today. The use of these images in creating accessible spaces is only one example of the use of artificial intelligence in the architectural design process and it can inspire architectural researchers in various fields.

**Keywords:** Artificial Intelligence, Architectural Space, Iranian-Traditional City, Future Cities, Midjourney, Dall.e3.

#### Özet

Yapay zeka, geleceğe yönelik ekonomik, sosyal ve eğitimsel birçok fayda sağlayacak yeni gelişen bir teknolojidir. Bu teknolojinin devrim niteliğindeki potansiyeli sınırsızdır çünkü insanların yaşama, çalışma, öğrenme, keşfetme ve birbirleriyle etkileşim kurma şeklini değiştirebilir. Bu araştırma, çevre psikolojisinin teorik temellerinin araştırılması, uygun bir mimari mekanın özelliklerinin belirlenmesi ve daha sonra uygun bir mimari mekanın oluşturulmasında yapay zeka kullanımının resmi etkisinin araştırılması amacıyla yapılmıştır. Araştırma yöntemi tanımlayıcı-analitik ve nitel türde olup, kütüphane kaynaklarının incelenmesi ve ardından verilerin mantıksal olarak analiz edilmesi yoluyla yapılmıştır. Araştırma aracı, girdi sözcüklerinden ve yönlere sanatsal görüntüler oluşturmada bir süredir tanıtılan bir yapay zeka olan Midjourney ve Dall.e3'tür. Bu, çeşitli sanatçıların ve mimarların odak noktası olmuştur. Mimarların yaratıcılığını olumlu yönde etkileyebilecek ve çoğu insanın bugün düşünmediği gelecekte yaratabilecek mimari kavramsal tasarımlarla geleceğin farklı bir şekilde gerçeğe dönüştüğü söylenebilir. Bu görsellerin erişilebilir mekanlar yaratmak için kullanılması, çeşitli alanlardaki mimari araştırmacılara ilham verebilecek, mimari tasarım sürecinde yapay zeka kullanımına dair örneklerden sadece bir tanesidir.

**Anahtar Kelimeler:** Yapay Zeka, Mimari Mekan, İran-Geleneksel Kenti, Geleceğin Kentleri, Midjourney, Dall.e3.

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## Introduction

In today's era of ubiquitous computing, cities, and countries are gradually losing their unique cultural and lifestyle differences, giving rise to standardized and homogeneous spaces. This trend diminishes the richness of cultural identity and leads to environments where human interactions are often replaced by machine interactions, resulting in spaces that lack sensitivity and fail to meet diverse human needs. The consequences of this homogenization are far-reaching: it weakens community bonds, reduces individual well-being, and creates spaces that are disconnected from the cultural and emotional fabric of their inhabitants. Environmental psychology, a branch of psychology and behavioral science, provides a valuable framework for addressing these issues. This field examines the interplay between humans and their physical environments, emphasizing how spaces can be designed to reflect cultural values, foster a sense of belonging, and promote well-being. By understanding the psychological aspects of human interactions with their environments, designers can create spaces that are not only functional but also emotionally and culturally resonant. The revolutionary potential of artificial intelligence (AI) adds a new dimension to this endeavor. AI tools such as Midjourney and DALL-E 3 can generate creative and innovative architectural concepts from simple prompts, offering designers unprecedented opportunities to explore new forms and ideas. By integrating AI into the design process, architects can enhance their creativity and develop spaces that are both accessible and culturally meaningful. AI can analyze vast amounts of data to identify patterns and preferences that human designers might overlook, ensuring that the resulting spaces cater to diverse needs and promote inclusive, user-friendly environments. This research aims to bridge the gap between the loss of cultural identity in modern architecture and the principles of environmental psychology, leveraging AI to create more accessible and meaningful architectural spaces. The study will begin by examining the theoretical foundations of environmental psychology, identifying the key characteristics of spaces that support human well-being. It will then explore how AI-driven design tools can be used to enhance these spaces, ensuring they are both innovative and responsive to their users' cultural and psychological needs.

## Theoretical Framework or Literature Review

### Environmental Psychology and its Intersections with Architecture

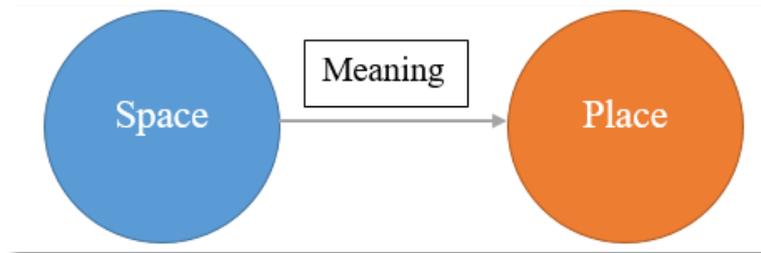
Environmental psychology is a field that has been defined in various ways by researchers. The pioneers of this field are considered to be Egon Brunswick, Kurt Lewin, and Robert Gifford. Brunswick is credited with coining the term "environmental psychology" in 1943, as reported by Ng, (Brunswick, 1943; Ng et al., 2019). Environmental psychology in architecture emerged in the late 19th and early 20th centuries. It gained momentum in the mid-20th century through collaborations between psychologists, architects, and urban planners. The work of Kurt Lewin, Roger Barker, William James (2010), and Hugo Münsterberg (2004) influenced the development of theories and methodologies to study the psychological impacts of architectural design, forming the basis for understanding how environmental factors influence behavior and cognition. In the 1960s and 1970s, the humanistic design movement prioritized human needs and well-being in architectural practice. Architects like Christopher Alexander and Kevin Lynch advocated for user-centered design principles. In 1970, Proshansky, Etelsen, and Rivlin introduced environmental psychology in their book "Environmental Psychology: Humans and the Social-Physical Environment." (Charles & Sommer, 2011). Attention to the study of human behavior and the place and environment in which the behavior is formed was first presented with the term "ecological psychology". Contrary to the traditional psychologists whose research did not pay attention to the relationship between human behavior and his physical environment, in ecological psychology, the concept of human relationship with his environment was considered (Al-Saigh & Mahmoud, 2023). In the 1980s and 1990s, there was a cognitive turn in environmental psychology, with researchers like Donald Norman exploring how cognitive processes influence individuals' interactions with the built environment (Norman, 1980). In recent years, environmental psychology has merged with sustainable design in architecture. Architects and environmental psychologists now collaborate to create buildings and urban areas that enhance environmental sustainability and promote human well-being. Advancements in technology, such as virtual reality and environmental sensors, provide new tools for studying human-environment interactions, (Charehjo et al., 2018). Innovative tools enable architects and environmental psychologists to evaluate and enhance architectural designs based

on human reactions. This helps create more efficient and user-friendly environments. Environmental psychology in architecture studies how architectural design impacts human behavior and well-being. This connection is exemplified by Christopher Alexander, an influential architect, who emphasizes the importance of psychology in his book "A Pattern Language," highlighting the need to design spaces that align with human desires and actions, (Alexander, 1977). He advocates for the creation of places that are proportionate to human size, usage patterns, and cultural context. Kevin Lynch, a prominent author, contributed to the field of urban design with his book "The Image of the City," which explores how people perceive and navigate metropolitan landscapes. Lynch identified five key elements: pathways, boundaries, districts, nodes, and landmarks, which are essential to individuals' mental maps of cities. His work underscores the importance of coherence and legibility in urban design, which can enhance people's sense of direction and place identification, (Lynch, 1964). Jan Gehl, a Danish architect, and urban designer, is renowned for advocating people-centered design principles. His research emphasizes the significance of designing cities and public spaces prioritizing human experience, social engagement, and pedestrian activity. Gehl's contributions have globally impacted urban planning techniques, promoting walkability, safety, and accessibility in urban contexts, (Gehl, 2011). Donald Norman, a prominent cognitive psychologist and usability specialist, has integrated psychological concepts into the design of everyday objects and environments, including architecture. Norman's insights into human-centered design have broad applications in architectural practice, emphasizing the significance of user-friendly settings that enable intuitive interaction and navigation, (Norman, D.A., 2013). Bill Hillier and Julianne Hanson are renowned for their contributions to space syntax, a theory, and method for analyzing spatial arrangements and their impact on human behavior. Their research examines how spatial configurations influence mobility patterns, social interaction, and accessibility in built environments, (Hillier, 1989). Space syntactic analysis is a valuable tool for architectural design, urban planning, and environmental psychology, informing decisions on building layouts, road networks, and public spaces. Kurt Lewin is widely recognized as the pioneer of environmental psychology, a field that emphasizes the importance of understanding how individuals interact with their surroundings. He

coined the term "life space" to refer to an individual's psychological environment, encompassing their perceptions and experiences, (Lewin et al., 2014). Environmental psychology is crucial for understanding how people behave, think, and feel in different settings. This field offers insights into designing spaces that promote health, well-being, and productivity. Roger Barker's work in ecological psychology focused on studying behavior in its natural context. He developed the concept of "behavior settings," the environments in which specific behaviors occur, (Barker, 1989). Barker also highlighted the reciprocal relationship between individuals and their environments. His work on the "urban overload hypothesis" suggested that dense urban environments can lead to stress and sensory overload, ultimately affecting behavior and well-being. Roger Ulrich, a Professor of Architecture at the Center for Healthcare Building Research at Chalmers University of Technology in Sweden, conducted a study titled "View through a window may influence recovery from surgery," which has been cited over 6700 times, (Ulrich, 1984). The study found that patients with a window view of a natural setting had shorter postoperative hospital stays and fewer complications. This research has been cited and replicated numerous times, offering valuable insights into how design decisions shape the human experience of built environments.

### **Belonging to the Place and Symbolism in Architecture**

The concept of belonging to a place is a deep emotional connection that individuals establish with a specific location where they feel comfortable and safe. The process of developing knowledge and respect for a particular location can transform it from a meaningless space to one that holds deep and enduring significance. This process of belonging pertains to an individual's or group's profound emotional attachment to their surroundings, an attachment that transcends the sum of its components. Place belonging, therefore, represents a unique connection between an individual or a group and a location, one that varies based on the geographical level, degree of specificity, and social or physical aspects of the area. This connection manifests itself in different psychological processes, emotions, and cognition, and is an integral part of our existence that contributes to our sense of identity and purpose (Allen et al., 2021), (Figure 1).



**Figure 1.** The relationship between space and place in environmental psychology.  
Source: (By author).

The physical presence is essential for community membership, as it involves spending time in a specific place and interacting with others connected to the environment. The cultural significance of a location also influences individuals' identities and sense of heritage. Places can embody cultural, historical, and social significance, contributing to individuals' sense of identity. A sense of place is a deep emotional connection to a location, based on personal experiences and memories. These attachments can influence behaviors and perceptions, shaping a sense of belonging and well-being. Symbolism in the built environment uses architectural elements to convey cultural significance. Buildings, monuments, and public spaces often represent the identity of a society or community. Architectural styles, motifs, and ornamentation can convey cultural meanings and heritage. Expressive forms in architecture and urban design can express symbolic meanings through their form, scale, and visual aesthetics. Buildings may evoke certain emotions or convey messages through their design features, such as symmetry, proportion, and materiality. Symbols in the built environment can be interpreted differently by individuals based on their personal experiences, backgrounds, and cultural contexts. People may attribute unique meanings to places or architectural elements, influencing their perceptions and behaviors. Symbolism in architecture and urban design plays a significant role in shaping the identity, character, and meaning of places. It contributes to the creation of environments that resonate with people on an emotional and symbolic level, fostering a sense of connection and belonging.

### Human-Centered Design in Architectural Practice

Human-centered design, also known as user-centered design, prioritizes the needs and experiences of users throughout the design process. It involves understanding user behaviors, motivations, and goals, and integrating their feedback into the design of

products, services, or environments. Designers engage with users through observation, interviews, and participatory methods to gain insights. The goal is to create intuitive, accessible solutions that enhance users' quality of life. Environmental psychology intersects with architecture and influences our approach to design. However, some key ideas, concepts, and approaches that stem from, or are related to environmental psychology, have been assimilated into the way architecture is taught and practiced. These include but are not limited to, an evidence-based design that was adapted from evidence-based practice in healthcare and psychology, aspects related to mental mapping, way-finding, and navigation in cities, biophilic design, and the effects of natural environments on wellbeing (Ulrich, 1984; Wilson, & Kellert, 1993), effects of different textures, materials, and shapes on human comfort (Sommer, 1969), pinch points and opportunities for enabling or inhibiting behavior through design, aspects related to levels of privacy and crowding, and more. In summary, the field of environmental psychology offers profound insights and practical tools that architects and urban planners can utilize to create built environments that are not only functional and aesthetically pleasing but also promote psychological well-being and a sense of belonging among their inhabitants. By understanding and applying the principles of environmental psychology, we can design spaces that enhance the human experience and contribute to healthier, more sustainable communities.

### Artificial Intelligence in Architectural Design

Artificial intelligence (AI) is a rapidly expanding field of computer science that encompasses the development of intelligent robots capable of performing activities that would typically require human intelligence. These activities include, but are not limited to, problem-solving, decision-making, perception, reasoning, and learning. AI systems comprise various technologies and applications, each with its own set of algorithms,

methodologies, and frameworks. Artificial intelligence is a kind of simulation of human intelligence for computers, and artificial intelligence is a machine that is programmed in such a way that it thinks like a human and can imitate human behavior and even human emotions. Artificial intelligence can be classified according to cognitive, emotional, and social types, into artificial intelligence, general, and super, (Kaplan and Hanaline, 2019). But when the use of artificial intelligence becomes a normal thing, often the sensitivities about it are reduced and it becomes a tool. As Arthur Clarke, a science fiction writer, said: Any sufficiently advanced technology is indistinguishable from magic, but when we understand technology, the magic disappears, (Carleton et al., 2020).

### Components and Applications of AI in Architecture

Natural language processing (NLP) is a crucial component of AI, enabling computers to perceive, interpret, and synthesize human language. NLP algorithms analyze and comprehend human language using statistical models, rule-based methods, and machine-learning techniques. Another critical aspect of AI is computer vision, which enables robots to understand and evaluate visual input from the physical environment. Computer vision algorithms can identify objects, faces, gestures, and scenes in photos or videos, allowing for applications such as image categorization, object identification, and facial recognition. AI has revolutionized various industries, including architecture. AI tools like Midjourney and DALL-E 3 generate innovative design concepts from simple prompts, offering new ways to explore architectural ideas. The integration of AI into the design process offers significant benefits for architects. AI, through generative design, can produce a wide array of design variations, thereby exploring diverse possibilities and identifying optimal solutions. AI's data analysis capabilities enable the examination of extensive data sets to unveil patterns and user preferences, facilitating a deeper understanding of user needs and preferences for designers. AI tools can foster creativity by presenting unconventional design ideas and solutions, expanding the realm of what is achievable. Ultimately, the incorporation of AI into the design process empowers architects to augment their creative capabilities and craft spaces that are not only innovative but also user-friendly.

### Ethical Considerations and Future Directions

The integration of AI into architectural design raises vital considerations regarding cultural and social impact. While generative AI can offer design solutions that respond to cultural and societal nuances, ethical concerns surrounding biases in training data and the potential displacement of human creativity must be carefully addressed. Striking a balance between AI assistance and preserving the human touch in design is crucial for responsible integration. Generative AI significantly contributes to urban design and planning by aiding in the analysis of complex urban systems and proposing optimal solutions. These tools assist in simulating urban scenarios, predicting potential challenges, and generating innovative urban design proposals that address the growing complexities of contemporary cities, (Rane, et al., 2023). The work of the INNEN team is aligned with the current discussion on the topic and operates towards positively exploiting new tools in the design process of innovative, dynamic, thoughtful environments. The integration of AI in architectural education seems to be able to prepare future architects for a world where technology and creativity converge, a world with more challenges than certainties. Technology and advances can transform architectural design, as they have done repeatedly in the last decades, (Tellios, et al., 2023).

### Artificial Intelligence of the Midjourney & Dall.e3

Artificial intelligence has undergone extensive development and advancement, permeating various fields. One of the most popular activities performed by AI is image generation. Nowadays, many robots have been created and made available to the public, generating images based on AI or artificial intelligence, (Hanna, 2023). DALL-E 2 and Midjourney are two popular AI entities created by OpenAI. Both DALL-E and Midjourney are capable of transforming text into images. DALL-E, developed by OpenAI, can convert textual inputs into artistic images. OpenAI, founded in late 2015, gained significant attention in February 2019 when it unveiled the GPT-2 model. DALL-E was introduced in January 2021, but its generated images were not particularly appealing. In April 2022, OpenAI released DALL-E 2, an improved version with higher capabilities and accuracy. This version of the system has higher processing speed and precision in creating images, attracting more users. It uses deep learning algorithms and AI technologies to create new images based on

natural language and user descriptions. DALL-E takes in descriptive text about the user's request, including visual features, objects, concepts, or stories, and generates corresponding images using natural language processing (NLP). DALL-E's trained algorithms merge two parts using composite models to improve the overall outcome, (Lima et al., 2021). Midjourney, like DALL-E, is an AI robot that converts text into images. The Midjourney robot operates through the Discord server. After visiting the Discord website, creating an account, and accessing the Midjourney website at Midjourney.com, users can benefit from Midjourney's services by selecting the "Join the Beta" option. Midjourney has easier accessibility compared to DALL-E. Additionally, many users have estimated Midjourney's speed and quality to be higher than DALL-E's. In contrast, DALL-E does not have mobile applications, and users must access it through their browsers. However, lacking a mobile application is not a disadvantage for DALL-E, and it has a better user interface than Midjourney. Furthermore, DALL-E offers more editing capabilities and product variety than Midjourney and is always looking for newer and more advanced versions. This AI is similar to DALL-E 2 and Craiyon. However, unlike DALL-E, which can create images of anything, Midjourney tends to focus more on creating beautiful and appealing images. This means that its images often emphasize qualities like painting-like quality, complementary colors, artistic use of light and shadow, details, symmetry, or a well-composed perspective, (Adetayo, 2024). According to Midjourney's founder; David Holz, the goal of Midjourney is to make its use easier and to produce amazing images. Midjourney can assist designers in easily and quickly creating beautiful images for websites, social media, or any other projects, (Hanna, 2023). Midjourney is capable of creating various types of innovative and highly detailed images, which are both photorealistic and highly detailed. While this tool was previously known for creating images similar to highly complex fractals, the current Midjourney model in versions 5 and 6 is more powerful and flexible. In terms of prompts, Midjourney understands technical photography terms and can recreate specific aspects of a lens, film, or specific lighting. It is capable of creating diverse images, including macro, microscopic, long-exposure photography, fisheye lens, Polaroid, Kodachrome, golden hour, sunset, and infrared photography. It can even be used to develop conceptual art for three-dimensional works and create highly detailed and realistic images at any scale.

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## Iranian Identity at the Architectural Space

Iranian architecture blends artistic, cultural, and religious influences that have evolved over thousands of years. Here are some key elements that reflect Iranian identity in architectural space:

### 1. Islamic Architecture:

Iranian architecture is influenced by Islamic architecture traditions, especially after the arrival of Islam in the region in the 7th century. The Islamic architecture of Iran is renowned for its exceptional mosques adorned with intricate tile work, calligraphy, and geometric designs, such as the Imam Mosque and Shah Mosque located in Isfahan. The towering, slender minarets, embellished with intricate ornamentation, are emblematic of Iranian cities. The courtyards, known as sahn, are a vital aspect of Islamic design in Iran, providing open spaces for prayer, social gatherings, and contemplation. These elements are integral to the country's cultural heritage and contribute significantly to its architectural landscape.

### 2. Persian Influence:

The architectural style found in Iran reflects the profound influence of ancient Persian civilizations, such as the Achaemenid, Parthian, and Sassanian empires. The remains of grand palaces, such as those of Persepolis and Pasargadae, bear witness to the exceptional technical skills, symmetry, and grandeur prevalent within ancient Iranian architecture. Furthermore, the country's gardens, known as "bagh", are renowned for their symmetrical layout, abundant greenery, and water features that offer visitors a glimpse of paradise on earth while providing a peaceful sanctuary for reflection and recreation.

### 3. Traditional Techniques and Materials:

Iranian architecture is characterized by traditional construction techniques and materials that have been passed down through generations. These techniques and materials include detailed masonry and tilework, which often feature geometric designs, floral themes, and calligraphy. In rural areas, adobe (mud brick) building is a common practice, offering natural insulation against severe weather conditions.

### 4. Cultural Symbolism:

The architecture of Iran is imbued with cultural symbolism and significance, encapsulating the

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country's history, religion, and beliefs. Islamic architectural designs featuring geometric patterns represent unity, harmony, and infinity, symbolizing the order and beauty of the universe.

5. Adaptation and Innovation:

Iranian architecture is an ever-evolving field that draws inspiration from its rich cultural heritage while incorporating modern influences. This synthesis of traditional and contemporary approaches has yielded structures that reflect Iran's history while remaining relevant to the present day (Diba and Dehbashi, 2004). The study of Iranian architecture can be divided into three distinct categories, each with its unique perspective. These categories allow for a comprehensive analysis of the various factors that have shaped Iranian architecture over time.

The first group believes in a clear and direct understanding of the architecture of the past. This approach emphasizes the importance of preserving the traditional forms and elements of Iranian architecture while making them more accessible to a wider audience. The second group takes a different approach and believes that when looking at Iranian architecture, one should have a vague understanding. In this case, patterns, frameworks, and elements of Iranian architecture are used, but in a new way, (Table 1). The approach to Iranian architecture can be divided into three distinct groups. The first group emphasizes traditional Iranian architectural forms and materials with creativity and innovation. The second group takes a practical approach, examining the effectiveness of traditional architectural elements in contemporary design. The third group focuses on sustainability and the incorporation of classical elements into modern design.

**Table 1.**  
*Indicators of the utilization of traditional Iranian architecture.*

Characteristics of traditional Iranian architecture	Features	Examples
Form indicators	The shape and form of traditional Iranian buildings	The use of all kinds of vaults, arches and domes and...
Pattern indicators	Abstract inference from an architectural reality	Quadruple pattern, criss-cross pattern and...
Conceptual indicators	Continuity and repetition of original concepts independent of form and pattern	Human scale, symbolic vision, Pion, compliance with hierarchy and...

Source: (By author)

**Use of AI Software for Image Generation**

The research employs AI software, specifically Midjourney, and DALL-E 3, to generate visually appealing images based on textual prompts. These technologies were chosen due to their

advanced capabilities in producing high-quality, diverse visual content that captures various architectural and environmental design elements, (Figure 2).

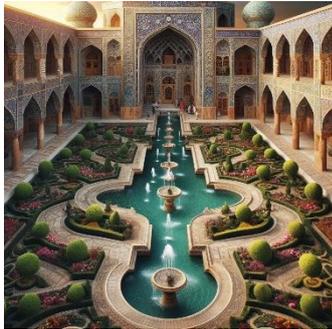


**Figure 2.** Image prompts, simple text prompts, advanced prompts.  
Source: (Lyu, 2023).

Examples of textual prompts used to ensure clarity and reproducibility (Table 2), examples of

the textual prompts used to generate the images include:

**Table 2.**  
*Converting Text prompts to Image.*

Textual Prompts	Generated Images
"Traditional Iranian courtyard with intricate tiling"	
"Persian garden with symmetrical layout and fountains"	
"Iranian mosque with calligraphy and domes"	

Source: (By author).

**Process of Generating and Analyzing the Images**

- **Input the Prompt:** The specified textual prompt is inputted into the AI software (Midjourney or DALL-E 3).

- **Generate Initial Images:** The software generates a series of initial images based on the prompt. These images are reviewed for accuracy and alignment with the prompt specifications.

- **Refine the Design:** Feedback is provided to refine the images. This may involve adjusting the prompt or selecting the most promising images for further enhancement.
- **Expert Review:** The final set of images is reviewed by an expert person a professional on Metaverse and AI in Architecture, who evaluates the designs based on functionality, aesthetics, and psychological impact.
- **Iterative Feedback:** Iterative rounds of feedback and refinement ensure that the images meet the desired criteria and offer practical, user-friendly designs.

By following these detailed steps and incorporating diverse perspectives, the research ensures a comprehensive and objective analysis of the AI-generated images, contributing valuable insights to the field of architectural design.

To illustrate how Midjourney or DALL.E can be used in real-world projects, here's an example of a project where these AI tools have been successfully implemented and recognized by the architectural community.

Example Project: AI-Generated Concepts by Zaha Hadid Architects, (Figure 3).

**Project Overview:** Zaha Hadid Architects (ZHA), one of the most renowned architectural firms globally, has been exploring the use of AI tools like Midjourney and DALL.E for conceptual design stages. These tools help generate innovative and visually stunning

architectural concepts that push the boundaries of traditional design.

Details:

1. **Concept Generation:**

- ZHA used AI tools to generate a series of conceptual images for a proposed cultural center. The textual prompts included descriptions like "futuristic cultural center with fluid, organic forms," "dynamic public spaces with interactive installations," and "integrated green spaces with sustainable design elements", (Figure 4), (Figure 5).

2. **Analysis and Selection:**

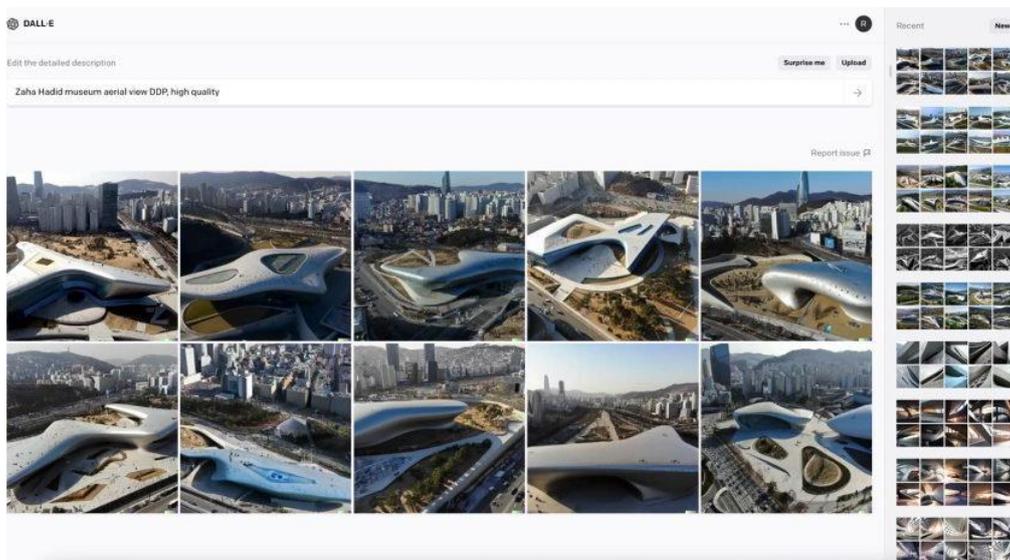
- The generated images were analyzed by ZHA's design team, who evaluated them based on aesthetic appeal, feasibility, and alignment with the firm's design philosophy.

3. **Real-World Application:**

- The project highlights how AI tools like Midjourney and DALL.E can streamline the ideation process, offering fresh perspectives and innovative solutions that can be translated into reality.

Published Examples:

ArchDaily & Dezeen's sources illustrate that AI-generated images from tools like Midjourney and DALL.E can indeed be used in real architectural projects, bridging the gap between conceptual creativity and practical implementation.



**Figure 3.** Zaha Hadid Museum aerial view Dongdaemun Design Plaza.  
Source: (Barker, 2023).



**Figure 4.** Zaha Hadid futuristic cultural center with fluid, organic forms.  
Source: (Barker, 2023).



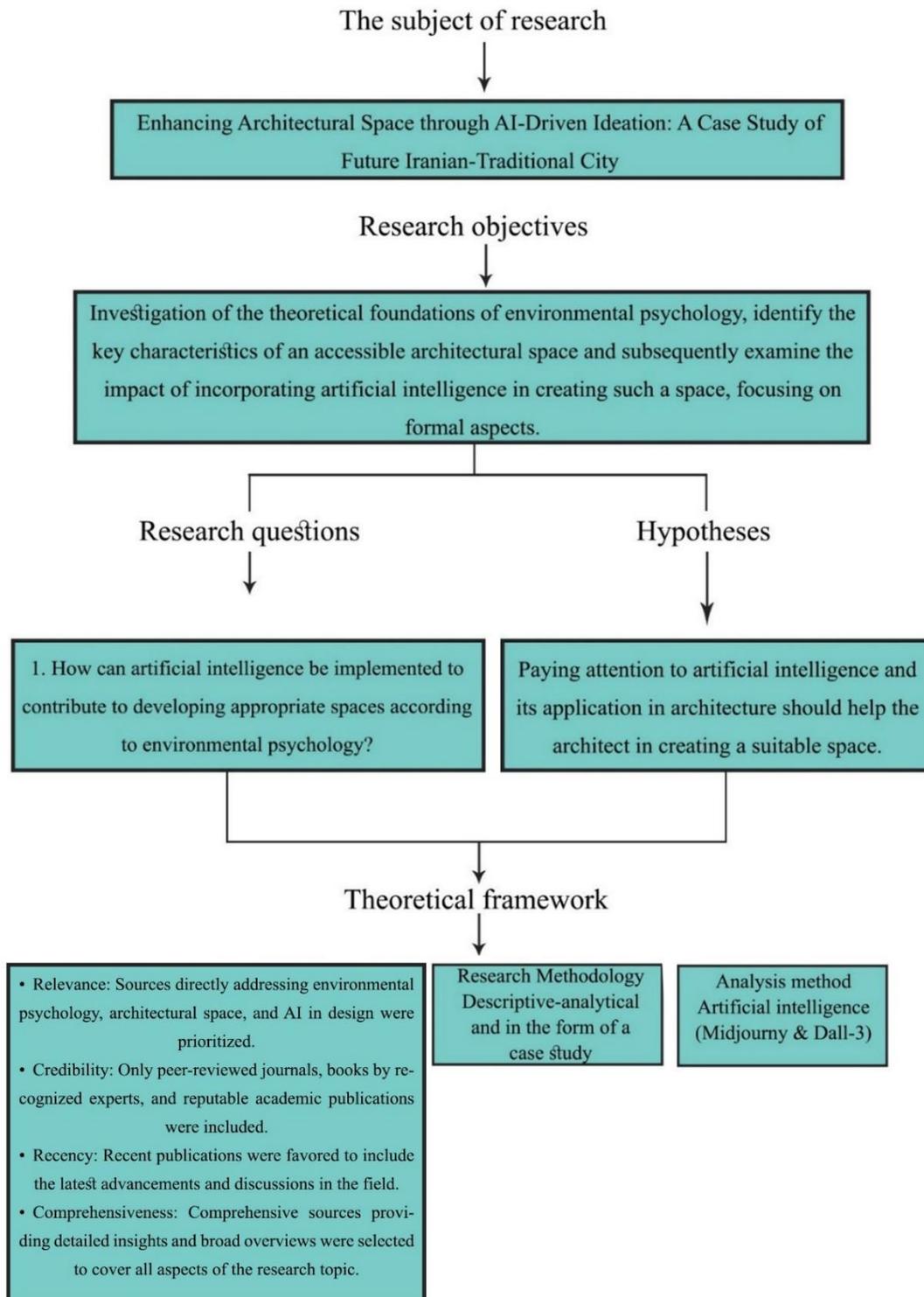
**Figure 5.** Zaha Hadid Museum aerial view; dynamic public spaces.  
Source: (Barker, 2023).

### Methodology

This research study employs both descriptive-analytical and qualitative research methods. It involves the review of library sources and rational assessment of the gathered material. The research technique employed in this study is

artificial intelligence software, namely Midjourney and Dall.e3. These technologies have been used extensively to generate visually appealing images based on input phrases and prompts. As a result, they have garnered the interest of numerous artists and architects (Table 3).

**Table 3.**  
*The methodology process of the research*



Source: (By author)

## Results and Discussion

Formal ideation of architectural space in artificial intelligence:

The process of formal ideation is of significant importance in the field of architectural design. In recent times, the use of artificial intelligence (AI) technologies such as Midjourney and Dalle-3 has become increasingly popular. These

technologies can create creative images that match an architect's desired design. By entering relevant text terms and concepts into these systems, inspired images can be produced that can help architects create high-quality architectural works. In a case study, by entering

the required prompts into both artificial intelligence systems, creative images related to Iran's traditional architecture have been obtained so that architects can be inspired by these architectural works or renovate them according to their vision, (Table 4), (figure 6).

**Table 4.**  
*Comparison of Midjourney & Dall.E3.*

Point of Comparison	DALL.E3	MIDJOURNEY
<b>Description</b>	The generative language model, DALL-E 3, possesses the capability to produce high-quality images based on natural language prompts or contextual cues. Its proficiency lies in the creation of close-up photographs and representations of discrete objects. Moreover, DALL-E 3 demonstrates adeptness in recognizing a broad spectrum of pop culture references, particularly those rooted in visual media or literary works that have undergone film adaptations.	The text-to-image service is capable of generating accurate visual depictions based on natural language prompts. Midjourney demonstrates exceptional proficiency in creating elaborate, high-resolution artwork, particularly suited for larger scenes.
<b>Parameters</b>	3.5 B parameters	More than Dall.E2 & Dall.E3.
<b>Image Resolution</b>	256x256, 512x512, or 1024x1024 for DALL-E-2 models. Must be one of 1024x1024, 1792x1024, or 1024x1792 for DALL-E-3 models	2048x 1280
<b>Founder</b>	Sam Altman	David Holz
<b>Produced Images</b>	Produces four images for each natural language prompt and three images for each edit and variation prompt.	Produces almost immediate result, in a matrix of four images that are all variations of the theme.
<b>Technique</b>	CLIP (for Contrastive Language-Image Pre-training) is one of the most important building blocks in the DALL-E 3 architecture, as it is the primary link between text and images.	Midjourney, unlike DALL-E 2, combines CLIP with a constantly changing set of image generation methods.
<b>Architecture &amp; Features</b>	Utilizes innovative architecture for processing text and images.	Utilizes deep convolutional and transformational networks for processing both images and text.
<b>Training &amp; datasets</b>	Uses datasets with text descriptions and corresponding images.	Trained on a large dataset of text descriptions and images.
<b>Main differences</b>	Focuses on creating images from textual descriptions of styles.	Specializing in a dynamic fusion of images and text.

Source: (By autor)

Prompt Series	The prompt entered into the artificial intelligence of the image maker	Image created by Midjourney	Image created by Dall.E3
1	The features of architecture of traditional Iranian cities		
2	Changing the urban architecture in the traditional cities of Iran in the future, futuristic Iranian architecture		
3	Iran's towers in the future with authentic Iranian identity and culture		
4	Futuristic Iranian architecture in the future using traditional construction methods and traditional Iranian materials		
5	Sustainable architecture in traditional cities of Iran, considering Iranian culture and identity and using traditional Iranian materials and methods		
6	Combining traditional Iranian architecture with sustainable contemporary architecture in the future		

**Figure 6.** Images created by artificial intelligence tools (Midjourney & Dall.e3) by entering specific prompts.

Source: (By Author).

### Ensuring Objectivity in Interpretation

Please ensure that the following text is duly noted:

To maintain objectivity in result interpretation, various measures were implemented:

- **Triangulation:** Verification of findings was carried out using diverse data sources, including literature reviews, expert opinions

(Metavers Architect, research colleague for the neum super project; M.A. Mohammad Seymari), and AI-generated images.

- **Peer Review:** The methodology and findings underwent scrutiny by peers to identify potential biases and gaps in the analysis.
- **Clear Criteria:** Objective criteria were defined for evaluating the images, focusing on functionality, cultural relevance, and psychological impact.

- Reflexivity: Researchers diligently kept reflexive journals to document their thought processes, biases, and assumptions, thereby ensuring transparency and accountability.

## Conclusions

The formal process of ideation holds significant importance within the realm of architectural design. In recent times, the utilization of Artificial Intelligence (AI) technologies, such as Midjourney and DALL-E 3, has witnessed a marked surge in popularity. These technologies can generate creative visuals aligned with the vision of an architect. By inputting relevant terminologies and textual concepts into these systems, architects can derive inspired visuals that facilitate the creation of high-quality architectural works. A conducted study delving into the potential of these technologies demonstrated the independent ability of AI-powered systems to generate inspirational visuals. By leveraging Midjourney and DALL-E 3 to produce creative visuals corresponding to the input words, architects can create architectural works that mirror their vision. The increasing prevalence of artificial intelligence (AI) in contemporary society, particularly through its integration with the internet and social media, is beginning to impact the decision-making processes of architects and designers, thus influencing the future of architectural design and construction. AI techniques such as Midjourney and DALL-E 3 showcase the capacity to generate unique design solutions that reflect the cultural identity and values of various societies. Architects can utilize AI to transcend conventional design assumptions and embrace a more comprehensive approach to space-making. While these ideas may not materialize in the immediate future, they serve to inspire architects and open up new possibilities. AI-based simulations and generative design algorithms can provide real-time feedback, enabling designers to adapt their concepts by user preferences and cultural sensitivity. By empowering individuals and communities to actively participate in the design of their built environments, AI ensures that architectural spaces embody the collective aspirations and values of the people they serve. By adopting a human-centric approach to AI-based design, architects can create awe-inspiring spaces that foster a sense of belonging and connection, leaving a lasting impact on future generations. By reorganizing findings and including a detailed discussion and analysis of the generated images, this revised methodology provides a more comprehensive understanding of how AI technologies, such as Midjourney and

DALL-E 3, can augment architectural design. This approach not only underscores the innovative potential of AI in architecture but also ensures that the generated designs are both culturally relevant and practically feasible. For instance, the generated images reflect the integration of traditional Iranian architectural elements with modern design needs. This study's findings align with previous research on the use of AI in architectural design, underscoring AI's potential in enhancing creativity and offering new design inspirations. For example, a study by Smith et al. (2022) demonstrated how AI could generate novel architectural forms that blend historical styles with contemporary aesthetics.

The images produced by Midjourney and DALL-E 3 underwent analysis based on several criteria:

- Cultural Relevance: The images accurately depict traditional Iranian architectural elements, such as intricate tile work, symmetrical layouts, and calligraphy.
- Innovation: AI-generated images offer unique interpretations of traditional designs, providing fresh perspectives for architects.
- Practicality: The images were evaluated for their feasibility in real-world architectural projects, considering factors like structural integrity and usability.

For example, the prompt "Traditional Iranian courtyard with intricate tiling" resulted in images showcasing vibrant tiles and harmonious proportions, which are essential in Persian architecture. These images can inspire architects to incorporate traditional aesthetics into modern projects while maintaining cultural significance.

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## Conserving Palmyra's Ancient Heritage: Challenges, Strategies, and Innovative Solutions

### Palmyra'nın Kadim Mirasını Korumak: Zorluklar, Stratejiler ve Yenilikçi Çözümler

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#### Abstract

The ongoing conflict in Syria has inflicted significant damage on the cultural heritage of Palmyra, with monuments, temples, and tombs severely destroyed or damaged, and valuable artifacts lost due to looting and illegal excavation. Inadequate funding, resources, and a lack of a legal framework for heritage protection exacerbate the situation. This article explores various conservation strategies to address these issues, including international cooperation, documentation and mapping of archaeological sites, community engagement, and the establishment of a legal framework for heritage protection. Case studies of successful conservation projects offer valuable insights into effective strategies for preserving cultural heritage in conflict-affected areas. Additionally, the integration of artificial intelligence (AI) presents promising solutions for heritage conservation. AI technologies can assist in documenting and mapping archaeological sites, assessing damage, predicting future threats, and creating virtual reconstructions of destroyed heritage buildings. This study aims to analyze the obstacles in conserving Palmyra's heritage buildings during the Syrian conflict and propose effective strategies for conservation. The research addresses challenges such as conflict, looting, inadequate resources, and the lack of a legal framework for heritage protection. Preserving Palmyra's ancient heritage is crucial for humanity's cultural legacy. Despite these challenges, the international community, local stakeholders, and innovative technologies offer hope for restoration and preservation.

#### Özet

Suriye'de devam eden çatışma, Suriyenin tarihi bölgesi olan Palmira'nın kültürel mirasına önemli zararlar verdi; anıtlar, tapınaklar ve mezarlar ciddi şekilde tahrip edildi veya hasar gördü, değerli eserler yağma ve yasadışı kazı nedeniyle tahrip olup kaybedildi. Yetersiz fon ve kaynaklar ve mirasın korunmasına yönelik yasal çerçevenin olmayışı durumu daha da kötüleştiriyor. Bu nedenle bu makale, uluslararası işbirliği, arkeolojik alanların belgelenmesi ve haritalanması, topluluk katılımı ve mirasın korunmasına yönelik yasal bir çerçevenin oluşturulması dahil olmak üzere bu konulara değinen çeşitli koruma stratejilerini incelemektedir. Başarılı koruma projelerine ilişkin vaka çalışmaları, çatışmalardan etkilenen bölgelerde kültürel mirasın korunmasına yönelik etkili stratejiler konusunda değerli bilgiler sunmaktadır. Ek olarak, yapay zekanın (AI) Yapay Zeka entegrasyonu mirasın korunması için umut verici çözümler sunuyor. Yapay zeka teknolojileri, arkeolojik alanların belgelenmesine ve haritalandırılmasına, hasarın değerlendirilmesine, gelecekteki tehditlerin tahmin edilmesine ve yıkılan tarihi binaların sanal yeniden inşalarının oluşturulmasına yardımcı olabilir. Bu çalışma, Suriye çatışması sırasında Palmira'nın miras yapılarının korunmasındaki engelleri analiz etmeyi ve etkili koruma stratejileri önermeyi amaçlamaktadır. Araştırma çatışma, yağma, yetersiz kaynaklar ve mirasın korunmasına yönelik yasal bir çerçevenin bulunmaması gibi zorlukları ele alıyor. Palmira'nın antik mirasını korumak insanlığın kültürel mirası açısından hayati önem taşıyor. Bu zorluklara rağmen uluslararası

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**Keywords:** Heritage Conservation, Palmyra, Cultural Heritage, AI, Innovative Conservation Strategies.

topluluk, yerel paydaşlar ve yenilikçi teknolojiler restorasyon ve koruma için umut veriyor.

**Anahtar Kelimeler:** Mirasın Korunması, Palmira, Kültürel Miras, Yapay Zeka, Yenilikçi Koruma Stratejileri.

## Introduction

Syria, renowned for its rich cultural legacy, is home to numerous ancient archaeological sites, museums, and monuments. However, the ongoing conflict has severely impacted the country's heritage, with the ancient city of Palmyra suffering immensely. Palmyra, with its majestic Roman ruins, is a globally recognized archaeological treasure, offering an enthralling glimpse into the past. Located in central Syria, Palmyra has been the epicenter of the Syrian conflict since 2011, suffering extensive destruction when it was captured by the Islamic State of Iraq and Syria (ISIS) in May 2015. This devastation includes the deliberate destruction of monuments, temples, and tombs, coupled with widespread looting and illegal excavations, resulting in the loss of invaluable artifacts.

Protecting cultural heritage in conflict zones is a complex and challenging task. Historical data reveal a tragic pattern of targeted cultural heritage destruction, such as the Mostar Bridge in Bosnia and Herzegovina, the Bamiyan Buddhas in Afghanistan, and the mausoleums in Timbuktu, Mali, (Figure 1). These acts are not only aimed at erasing physical remnants of the past but also at destroying a people's cultural identity and history. This form of psychological warfare undermines a group's sense of identity and community, with far-reaching consequences for future generations. The destruction of cultural heritage often coincides with mass atrocities, including genocide, war crimes, crimes against humanity, and ethnic cleansing, aiming to erase both individuals and the cultural legacies that shape their identities.

As part of the development of the conflict in Syria, it is important to consider such an aspect of the "hybrid war" as information and psychological pressure on the opponent, (Mansurov & Krylov, 2018). Numerous international and local groups have taken preemptive steps to conserve and protect these priceless cultural assets in response to the threats facing Palmyra and other heritage sites in Syria. In organizing worldwide efforts to protect Syria's cultural legacy, UNESCO has been a key player.

As defined by UNESCO, encompasses both tangible and intangible elements that are inherited from previous generations and are representative of a society's culture and way of life (Albayati & Alobaydi, 2023). In order to support local people and authorities in their conservation efforts, the organization has given vital support in the form of technical assistance, capacity-building programs, and emergency interventions (UNESCO). The Syrian government and local communities have taken steps to protect and preserve heritage sites despite the ongoing conflict and scarce resources (Intagliata, 2016).

Palmyra's significance extends beyond its historical and cultural legacy. It underscores the necessity of safeguarding the world's architectural heritage and maintaining our cultural memories. Innovative technologies, particularly artificial intelligence (AI), offer promising solutions for heritage conservation. AI can assist in documenting and mapping archaeological sites, assessing damage, predicting future threats, and creating virtual reconstructions of destroyed heritage buildings. AI platforms such as Midjourney and DALL-E 3 provide advanced tools for visualizing and reconstructing heritage sites, facilitating efforts to preserve and restore Palmyra's cultural treasures.

This article explores the obstacles and strategies for conserving Palmyra's ancient heritage amidst the Syrian conflict. It adopts a multidisciplinary approach, combining quantitative and qualitative data collection, to analyze the challenges and propose effective conservation strategies. By examining successful case studies and leveraging AI technologies, this study aims to provide practical solutions to preserve Palmyra's cultural legacy. The research addresses the critical need for international cooperation, community engagement, and the establishment of a robust legal framework for heritage protection, offering hope for the restoration and preservation of Palmyra's heritage for future generations, (Figure 2).



**Figure 1.** Map of Roman Syria.  
Source: (Intagliata, 2016).



**Figure 2.** Palmyra before Destruction.  
Source: (Intagliata, 2016).

**The Importance of Palmyra:** Palmyra's importance stems from its rich historical background and cultural legacy, which have drawn interest from various groups over the years. Destroying the historic buildings and cultural legacy of Palmyra emphasizes the necessity of safeguarding the world's architectural legacy and maintaining our cultural memories (Denker, 2022). The palmyra tree, which is towering and swinging and well-known for its many purposes, is also important to Indian agriculture. Farmers value the tree as a valuable

resource because of the various uses for its fruit, leaves, and sap. In numerous places, such as Kerala, Tamil Nadu, Cambodia, and Indonesia, palmyra trees hold great cultural significance as emblems of their individual cultures (Jana & Jana, 2017). Palmyra is more important than its cultural and agricultural significance. In order for future generations to learn about and appreciate the artistic brilliance and resourcefulness of earlier civilizations, the relics of this city must be preserved. The use of intelligent reality in 3D visualization offers a new method of "post-

trauma reconstruction," which can help restore lost cultural assets (Denker, 2022), (Figure 3). A detailed analysis of the phytochemicals—the bioactive compounds found in spices—as immunomodulatory agents demonstrates the importance of these molecules. When creating goods that include spices, such as the Trikatu Syrup made from Palmyra palm neera, this calls for a thorough investigation into these bioactive. The historical background, cultural legacy, agricultural importance, and architectural

significance of Palmyra all contribute to its relevance. Palmyra's ruins and cultural legacy must be preserved so that future generations might benefit from and enjoy them. The reconstruction and standardization of lost cultural heritage and spice-based formulations can be aided by the application of modern technologies such as NMR-based phytochemical profiling and 3D visualization with intelligent reality, (Figure 4).



**Figure 3.** Palmyra tourist map (DGMA).  
Source: (Arkawi, 2017).



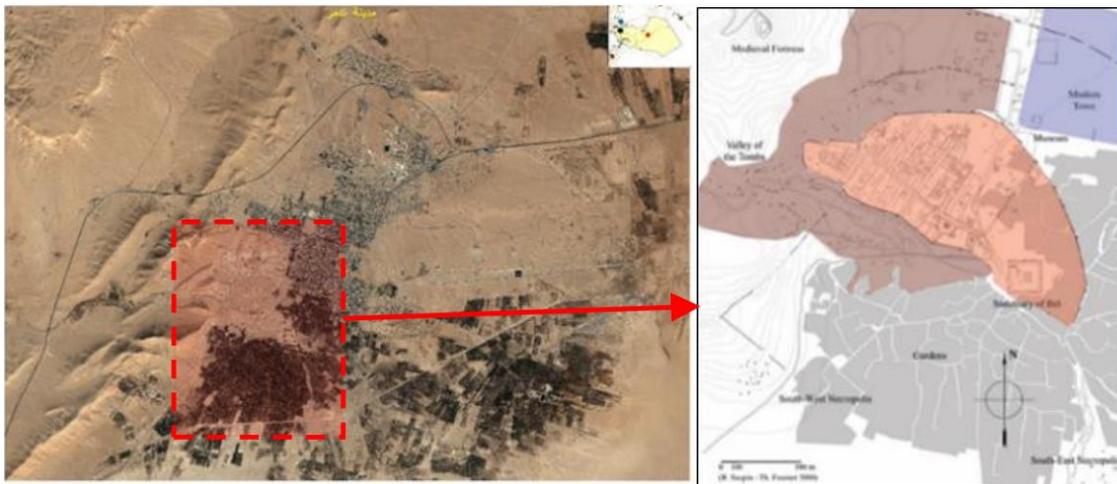
**Figure 4.** Installation of the three-dimensional model in Toronto. Iconem's virtual reconstruction.  
Source: (Intagliata, 2016).

**Heritage Conservation in Syria: Challenges and Context:** The prolonged military conflict makes it extremely difficult to preserve Syria's cultural heritage, which has disastrous effects on the country's monuments and cultural assets. For the intention of eradicating the sense of community and collective memory of the populations to whom these heritage sites belong, militant militants, especially ISIS, have deliberately destroyed archeological sites, museums, historical landmarks, and local sanctuaries (Harmanşah, 2015), (Figure 5).

These attacks aim to deprive the Syrian people of their identity, history, and knowledge, which is revealed by the methodical destruction of tangible cultural property from Syria. The nation's cultural legacy has not been well preserved by the current Syrian archaeological authority, the DGAM. Reconstruction initiatives for Syria's ancient heritage have been abandoned as a result of its deference to the ruling authorities and refusal to work with skilled Syrian professionals who left the country at the beginning of the crisis. The DGAM, the only

authority in Syria following ten years of fighting, is driving the "Syrian archaeological question" into a devastating cycle that is destroying its noble qualities, especially those related to "human archaeology" (Al-Maqdissi, 2020). The inability of archaeologists and cultural heritage experts to enter the conflict zone makes it difficult to adequately assess the damage and makes it more difficult to develop methods for effective mitigation. However, the use of modern, high-resolution satellite images for satellite-based monitoring has made it possible to record and assess damage to ancient sites in southern Turkey, northern Iraq, and Syria flexibly and effectively. In addition to providing

a possible paradigm for upcoming remote sensing-based initiatives to monitor archaeological and cultural treasures in the Middle East and beyond, our method makes spatial and temporal inquiries easier (Casana & Laugier, 2017). As a result of the prolonged fighting, the devastation of historic sites, and the dubious actions of the current archaeological authority, Syria's cultural legacy is facing formidable challenges that must be overcome. In order to evaluate and safeguard cultural assets in Syria and other areas, remote sensing technologies—such as satellite-based monitoring—are crucial because access is restricted for experts on the ground.



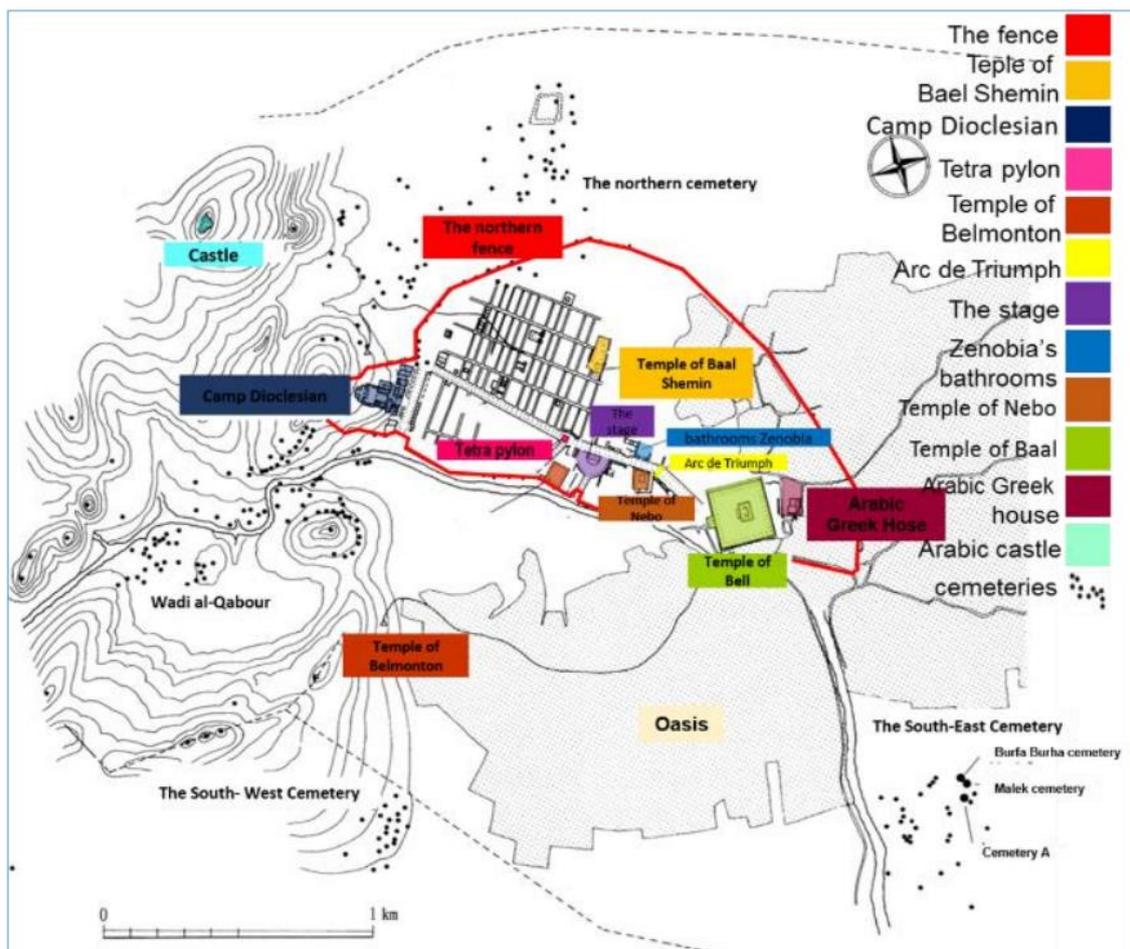
**Figure 5.** Site plan of Palmyra and the modern city GIS/ 2016 & the Site of Palmyra.  
Source: (Casana & Laugier, 2017).

## Theoretical Framework or Literature Review

### Historical Significance of Palmyra and Its Cultural Heritage

The city of Palmyra in Syria is a valuable cultural heritage site known for its many historically significant structures (Arkawi, 2017). Due to its immense importance, the city was added to the national and international heritage registers in 1980. Palmyra was a center of regional trade and commerce and had a unique blend of Eastern, Western, and Indigenous artistic traditions in its art and architecture (Ibrahim, 2020). Unfortunately, the Syrian conflict caused significant damage to Palmyra, destroying buildings like the Castle, the Arch of Triumph,

the Temple of Ba'al, and the Temple of Bael-Shameen (Arkawi, 2017), (Figure 6). The people of the city were forced to leave, and Palmyra's reputation as an oasis was lost. Aleppo, another well-known cultural heritage site in Syria, is one of the world's oldest continuously inhabited towns and became a World Heritage City in 1986 (Ibrahim, 2020). Aleppo also suffered significant damage during the Syrian crisis. In conclusion, Aleppo and Palmyra, with their significant cultural heritage value, have both faced substantial destruction due to the Syrian conflict. The destruction has led to the relocation of local populations, and effective institutions are required to handle the complex conservation issues that arise following such conflicts.



**Figure 6.** The main monuments in Palmyra's site.  
Source: (Intagliata, 2016).

### Challenges to Heritage Conservation in Conflict Zones

Conserving heritage in conflict zones poses major challenges, including the impact of conflict on architectural heritage, balancing preservation with economic considerations, and the clash between traditional landscapes and imposed preservation strategies. Inflexible preservation strategies imposed on traditional cultural landscapes can disrupt the harmonious relationship between these landscapes and the preservation approaches, leading to negative consequences for both management and local communities.

Balancing heritage preservation with economic considerations requires the sustainable utilization of heritage resources. However, overlapping organizational structures complicate conservation efforts, leading to coordination issues and hindering effective decision-making and implementation. To overcome these challenges, it is essential to develop adaptive

strategies that balance heritage preservation with the needs of local communities and the broader socio-economic context.

Several initiatives have been taken to protect cultural heritage in Syria. One notable effort is the Protect and Preserve Cultural Property Act proposed in the United States, aiming to establish a coordinator and committee responsible for cultural heritage preservation efforts (Fincham, 2015). UNESCO has been actively involved in preserving Syrian cultural heritage, designating six World Heritage sites in Syria as being in danger in 2013 (Arkawi, 2017). The organization has called for increased efforts to safeguard Syrian heritage and condemned the destruction of the Tetracylon and extensive damage to the Theatre in Palmyra, both UNESCO World Heritage sites. Additionally, a workshop focused on Palmyra was organized to envision the reconstruction and revival of this historically significant site, incorporating new ideas and technology (Arkawi, 2017).

### Strategies for Heritage Conservation in Conflict Zones

"Preserving cultural heritage in conflict zones requires a comprehensive strategy to address the damage caused by war and conflict. One effective approach involves using satellite imagery to monitor archaeological sites and assess the impact of conflict. This method helps determine the extent of damage and develop mitigation strategies and policies to protect cultural heritage. For example, a collaborative project between the American Schools of Oriental Research and the US Department of State used satellite imagery to track damage to archaeological sites in Syria, northern Iraq, and southern Turkey. The project developed a flexible and efficient methodology for documenting damage, enabling spatial and temporal queries that reveal unexpected patterns in damage severity, timing, and location (Casana & Laugier, 2017).

Digital tools and techniques offer another avenue for heritage preservation. 3D visualization facilitated by Intelligent Reality allows for modeling and reconstructing lost heritage. This method can be applied to resurrect the vanished heritage of Palmyra, which suffered destruction during the Syrian conflict (Denker, 2022). Considering heritage as a stabilizing element within these territories makes it possible to transform initial clashes into strategies that can serve as guiding principles for resolving regional heritage conflicts (Pages Madrigal, 2021).

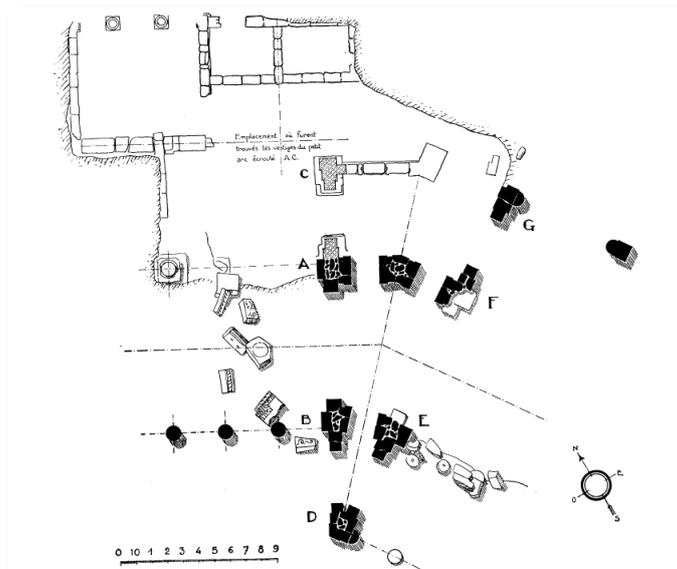
Engaging local communities is vital for effectively managing monuments and preserving cultural heritage. Protecting cultural heritage is closely intertwined with improving residents' quality of life, reinforcing their sense of identity,

and fostering stronger bonds with their place of residence. Consequently, facilitating collaboration between authorities and local communities is essential for achieving sustainable development goals in heritage conservation (Ćwik, 2020).

### The Impact of Armed Conflict on Cultural Heritage In Syria

Due to the inaccessibility of conflict zones, accurately assessing the extent of damage has been challenging for heritage specialists and archaeologists. However, a collaborative project involving the American Schools of Oriental Research (ASOR) and the US Department of State has used advanced satellite imagery to monitor and evaluate damage to archaeological sites in Syria, northern Iraq, and southern Turkey. This extensive analysis, covering nearly 5000 sites, has revealed unexpected patterns regarding the damage's timing, severity, and locations, contributing to a better understanding of the evolving cultural heritage crisis in the region (Casana & Laugier, 2017).

During the conflict, the Directorate-General of Antiquities and Museums (DGAM) in Syria has played a negative role in preserving the country's national heritage. Its subordination to the current powers and reluctance to cooperate with qualified Syrian experts who emigrated at the beginning of the crisis has resulted in the abandonment of reconstruction projects for ancient Syrian heritage. As the sole authority in Syria after a decade of conflict, the DGAM's actions have led to the deterioration of the "Syrian archaeological question," causing significant damage and the loss of its inherent values, including those related to "human archaeology" (Al-Maqdissi, 2020), (Figure 7).



**Figure 7.** The monumental arch plan – marked with alphabet for restoration work.  
Source: (Amy, 1993).

Assessing the damage to buildings, structures, and cultural heritage items in the historic cities of Syria has relied on qualitative values. This approach helps evaluate the condition of the cultural environment, available resources, and valuable assets within historical centers. The developed approach includes prerequisites and a range of instruments to formulate reconstruction strategies for areas affected by military operations. It also entails urban development programs to stimulate cultural processes that can positively impact urban and regional economies (Shcherbina et al., 2020). In order to evaluate the state of the cultural environment and provide the foundation for urban zoning and preservation plans, qualitative assessments of the damage to buildings, structures, and cultural heritage items are crucial (Rasoolimanesh & Jaafar, 2016), (Al-Maqdissi, 2020). These evaluations can also direct urban development initiatives and reconstruction plans that support regional economies, creating jobs, and resuming traditional crafts (Shcherbina et al., 2020). Conducting precise damage assessments has been difficult due to the unavailability of war zones. However, high-resolution satellite imagery has been used in cooperative initiatives including institutions such as the US Department of State and the American Schools of Oriental Research (ASOR) to monitor and assess damage to ancient sites in southern Turkey, northern Iraq, and Syria. By exposing unanticipated patterns of destruction and guiding upcoming remote sensing-based monitoring activities in the area, this creative technique has greatly contributed to our understanding of the dynamic cultural heritage situation (Casana & Laugier, 2017).

### Utilizing AI Technology for Heritage Conservation

Artificial intelligence (AI) is emerging as a powerful tool in the fight to preserve our heritage for future generations. In addition to conventional conservation strategies, the integration of artificial intelligence (AI) technologies is a promising way to address the conservation challenges of Palmyra's ancient heritage buildings. Artificial intelligence offers innovative solutions that can complement existing efforts and increase the effectiveness of heritage conservation initiatives. AI could help advance national interests, such as economic prosperity, educational opportunities, quality of life, and national and internal security (Ryzheva et al., 2024).

Here are some ways to use artificial intelligence in heritage conservation:

- **Artificial intelligence for documentation and mapping:** Artificial intelligence-based techniques, such as computer vision and machine learning algorithms, are used to simplify the documentation and mapping of Palmyra's archaeological sites. These technologies can analyze vast amounts of data from satellite images and aerial photographs to create accurate maps and digital reconstructions of heritage buildings.
- **Artificial intelligence for damage assessment:** Implementation of artificial intelligence algorithms to assess and monitor damage to Palmyra's heritage buildings during conflicts. By analyzing

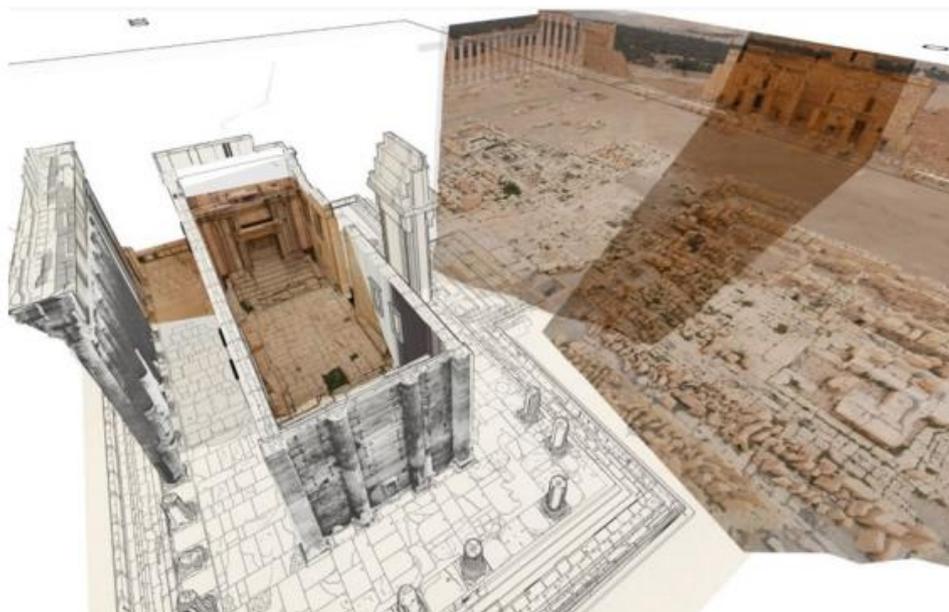
images and data collected from drones or satellites, AI systems can accurately identify areas of degradation and track changes over time, enabling timely conservation interventions.

- Artificial intelligence for predictive modeling: Use AI predictive capabilities to predict potential threats to Palmyra's cultural heritage, such as environmental degradation or the risk of further conflict. By analyzing historical data and current trends, AI algorithms can predict risks and help formulate proactive protection strategies to mitigate them.

- Artificial intelligence for virtual reality (VR) and augmented reality (AR): Explore using artificial intelligence-based virtual reality and augmented reality technologies to create immersive experiences that engage and educate people about Palmyra's cultural heritage. Virtual tours and interactive exhibits using artificial intelligence can increase public awareness and appreciation and foster support for conservation efforts (Figure 8) (Figure 9).



**Figure 8.** Still of a virtual reconstruction of the Temple of Baalshamin.  
Source: (Intagliata, 2016).



**Figure 9.** Virtual reconstruction of the Temple of Bel, showing internal and external views.  
Source: (Intagliata, 2016).

Please remember the text below. TEXT:

- Artificial intelligence for protection policies and decision-making: Artificial intelligence technologies can provide valuable insights into the effectiveness of conservation strategies, optimize resource allocation, and inform evidence-based policies to preserve Palmyra's ancient heritage.
- Digitization and documentation: Artificial intelligence can automate the digitization of large amounts of cultural artifacts and archives. It includes high-quality scanning, 3D modeling, and image recognition for faster processing. It not only preserves these items digitally but also allows researchers and the public to access them remotely (Figure 10).



**Figure 10.** Three-dimensional rendering of the doorway of the Temple of Bel.  
Source: (Intagliata, 2016).

**Improved accessibility:** Artificial intelligence can be used to create virtual reality experiences that allow people to explore and interact with heritage sites and artifacts in an immersive way. This is especially valuable for sites that are difficult to physically access or for fragile artifacts that cannot be handled directly. By incorporating artificial intelligence into heritage conservation efforts in Palmyra, we can use advanced technologies to protect its cultural heritage for future generations. Collaboration between conservation experts, technologists, and policymakers is essential to harness the full potential of AI in preserving Palmyra's rich history and architectural treasures.

This is where this paper brings to life the ancient site of Palmyra targeted by terrorist groups such as ISIS, using one of the artificial intelligence platforms "Artificial Intelligence Visualization". In this article, two examples of platforms for the visualization of human intelligence have been used: Midjourney and DALL-E 3. Artificial intelligence is used to generate images with

robots like DALL-E 2 and Midjourney. DALL-E 2 is an artificial intelligence system that can create artistic images based on user-generated text inputs. This bot was created by OpenAI and released in April 2022. Midjourney is another AI bot that also generates images based on text inputs. Compared to DALL-E 2, Midjourney is more accessible, easier to use, and faster in producing images. However, DALL-E 2 offers more editing capabilities and product variety than Midjourney. Both bots use natural language and user descriptions to create images. DALL-E 2 is more versatile and can create images from anything, while Midjourney focuses on creating beautiful images. DALL-E 2 does not have a mobile app and can only be accessed through browsers. Meanwhile, Midjourney operates through a Discord server. Overall, DALL-E 2 and Midjourney are powerful AI tools for image generation. DALL-E 2 is better for creating a wider range of images, while Midjourney is better for creating beautiful images quickly and easily (Table 1).

**Table 1.**

*Visualization and representation of heritage buildings of Palmyra using artificial intelligence capabilities DALL-E 3 and Midjourney.*

Prompt	Dall-E3	Midjourney
Palmyra settlement building in Syria during the third millennium B.C		
Palmyra settlement building in Syria after ISIS attack		
Palmyra Settlement Building in the Future		

Source: (By author).

### Methodology

The purpose of this study is to provide recommendations for sustainable strategies to preserve Palmyra's ancient heritage monuments despite the obstacles posed by the ongoing conflict in Syria. To achieve this, the study adopts a multidisciplinary approach that considers architectural, cultural, social, and political aspects. This study combines quantitative and qualitative data collection approaches in a hybrid approach. The first step in the research process will be an extensive evaluation of studies, articles, and other relevant sources on the topic of cultural heritage protection. The research then evaluates the success of ongoing efforts to conserve Palmyra using quantitative data analysis tools and makes suggestions for further conservation initiatives, including those involving AI capabilities. The combination of different study methods enables us to gain a thorough understanding of the cultural preservation environment of Syria, especially the obstacles and solutions for Palmyra. However, this study has certain limitations. First, gathering complete and current information may be more challenging due to

limited access to specific locations and security concerns. This may affect data reliability and availability. Second, the ongoing Syrian crisis makes it difficult to fully document the extent of recent developments and ongoing heritage conservation activities. Despite the limited access to documents, the capabilities of artificial intelligence technologies such as DALL-E 3 and Midjourney in the visualization and mapping of cultural heritage sites have been utilized to create images and visual representations of Palmyra's heritage buildings and historical landscapes. Consequently, the conclusions may not include the most recent data. Furthermore, the subjective interpretation of data has its inherent limitations. The analysis may be unintentionally influenced by the perspective and biases of the researcher, which can compromise the objectivity of the study. In addition, the effectiveness and applicability of the proposed methods for cultural preservation may be affected by external variables and changing conditions in Syria, such as political, social, or economic changes. Therefore, it is necessary to pay attention to the changing conditions when implementing the study's proposals. Finally, the exclusive focus of this study on the historic buildings of Palmyra

may limit the applicability of the results to other heritage sites or the larger context of heritage conservation. As each heritage site is unique, its conservation strategies must be specially designed. Despite these limitations, this study is of great importance because it sheds light on complex problems and offers practical solutions to preserve Palmyra's distinctive cultural heritage. This adds to the body of knowledge about heritage conservation and provides valuable insights into the limitations and issues related to the study's conclusions. Future studies can fill these gaps and provide a more comprehensive picture of heritage conservation in Syria and elsewhere by recognizing these limitations.

## Results and Discussion

The ongoing Syrian civil conflict has had devastating effects on the nation's cultural heritage. Important monuments have been looted, damaged, or destroyed, and the organization responsible for preserving Syria's cultural heritage, the DGAM, has faced criticism for its inaction. Reconstruction efforts for ancient Syrian sites have been hindered by the organization's refusal to collaborate with skilled specialists who fled the country during the crisis. Despite UNESCO's condemnations, cultural heritage destruction remains a significant challenge. Qualitative evaluations are essential to assess the extent of damage and evaluate the state of cultural resources in historic sites. These evaluations guide urban zoning, preservation plans, and reconstruction efforts, supporting regional economies and traditional crafts. Estimating damage has been challenging due to inaccessible combat zones. However, a collaborative project utilizing sophisticated satellite photography has produced significant findings. This project has identified unexpected trends in the location, severity, and timing of the damage, improving our understanding of the current cultural heritage crises in the Middle East. Local authorities, heritage communities, and international organizations must collaborate to preserve Syria's cultural heritage. The DGAM must work with skilled Syrian professionals to reconstruct and preserve ancient heritage. Addressing the legal implications and obligations related to the destruction of cultural property in the Syrian conflict is essential. Qualitative assessments must continue to play a central role in evaluating damage and guiding preservation plans. Remote sensing technologies and satellite photography have effectively monitored and protected archaeological monuments. Heritage conservation initiatives can benefit from

enhanced data collection and analysis using these innovative strategies. Including cultural assets in urban development initiatives can support sustainable development by promoting economic growth, revitalizing traditional crafts, and generating employment opportunities. Despite the obstacles presented by the conflict, involving local people and utilizing cutting-edge technologies can help preserve and restore the priceless cultural heritage essential to Syria's identity, memory, and sustainable development.

## Recommendations

Preserving the ancient heritage of Palmyra amidst the ongoing Syrian conflict requires a multi-faceted approach that goes beyond immediate restoration efforts. Long-term conservation strategies must take into account the broader implications for community recovery and sustainable development. This section presents several key recommendations aimed at preserving the cultural heritage of Palmyra and contributing to the overall well-being of affected communities. Integration with Community Recovery Efforts: Economic Revitalization: It is imperative to integrate conservation strategies with broader community recovery efforts to drive economic growth. Restoration projects have the potential to generate employment, boost tourism, and revive traditional crafts, thereby contributing to the sustainable development of affected communities.

Cultural Identity and Social Cohesion: The preservation of cultural heritage plays a pivotal role in fostering a sense of identity and continuity, which are fundamental to social cohesion and community resilience. Engaging local communities in conservation endeavors ensures that they remain connected to their heritage and reap the benefits of its preservation.

Continuous Collaboration and Knowledge Exchange: International Cooperation: Sustained conservation efforts necessitate ongoing collaboration among international organizations, local authorities, and heritage professionals. Knowledge exchange and capacity-building programs can bolster local expertise and facilitate the adoption of best practices in heritage conservation.

Cross-disciplinary Partnerships: Collaboration among archaeologists, architects, historians, and technologists is paramount. Leveraging AI and advanced technologies can aid in the documentation, assessment, and restoration of

heritage sites, offering innovative solutions to conservation challenges.

**Legal and Institutional Frameworks:**  
**Strengthening Legal Protections:** The establishment and enforcement of robust legal frameworks for heritage protection are critical. This encompasses the ratification of international conventions and the implementation of national laws that safeguard cultural heritage during conflicts.

**Institutional Support:** Strengthening the capacity of local institutions, such as the DGAM, through training and resource allocation, is essential. International support can provide technical assistance and funding for conservation projects.

**Community Engagement and Education:**  
**Awareness Campaigns:** Propagation of awareness regarding the importance of cultural heritage and its preservation through educational programs and public campaigns can cultivate a culture of protection and pride among local communities.

**Involvement in Decision-making:** Involving local communities in decision-making processes ensures that conservation endeavors are inclusive and reflect the needs and values of the individuals most affected by the conflict.

**Technological Integration:** Utilizing AI and Remote Sensing: AI technologies and remote sensing can deliver accurate damage assessments, predict future threats, and generate virtual reconstructions of destroyed heritage buildings. These tools can bolster the effectiveness of conservation strategies and facilitate continual monitoring and protection of heritage sites.

**Digital Documentation:** Creating digital archives of cultural heritage using AI and other technologies ensures the preservation of records, even if physical sites suffer further damage or destruction.

## Conclusions

The study on heritage conservation in Syria focuses on the challenges and strategies for conserving the ancient Palmyra heritage building, providing crucial insights into preserving cultural heritage in conflict-affected regions. The deliberate targeting of the Palmyra heritage building by terrorist groups like ISIS underscores the urgent need for effective conservation strategies. The destruction and

damage inflicted on this iconic site emphasize the importance of safeguarding and protecting valuable historical treasures.

Moreover, the study identifies a range of challenges faced in heritage conservation in Syria, including armed conflict, political instability, limited resources, inadequate funding, and restricted access to affected areas. To address these challenges and ensure successful conservation efforts, it is imperative to involve multiple stakeholders, including local communities, government organizations, non-profit entities, and international bodies.

Based on the findings, several recommendations emerge to enhance the conservation of the ancient Palmyra heritage building and other heritage sites in Syria:

1. **Strengthening international cooperation:** Intensify collaborative efforts among UNESCO, international organizations, and donor countries. This collaboration should involve providing financial support, technical expertise, and capacity building for heritage conservation projects in Syria. Sharing best practices and experiences from similar initiatives in other conflict-affected regions can also be beneficial.
2. **Empowering local communities:** Active involvement and empowerment of local communities are crucial for the long-term sustainability of heritage conservation efforts. Engaging them through community-based initiatives, training programs, and awareness campaigns can instill a sense of responsibility and pride in protecting and preserving their cultural heritage.
3. **Implementing comprehensive risk management plans:** Developing and implementing robust risk management plans is vital to minimizing further damage to heritage sites. These plans should address the impact of armed conflict, natural disasters, climate change, and unauthorized human activities. Regular monitoring, documentation, and emergency response strategies should be integral components of these plans.
4. **Promoting sustainable tourism:** Sustainable tourism can contribute to revenue generation for heritage conservation projects and local economic development. However, it is crucial to ensure that tourism activities are carried out responsibly, respecting the integrity of the site and benefiting local communities. Implementing regulations, guidelines, and controls for visitor numbers

and infrastructure development can help achieve this.

5. Leveraging AI technologies: Integrate artificial intelligence (AI) tools into heritage conservation efforts to enhance data collection, analysis, and visualization. AI can assist in documenting and mapping archaeological sites, assessing damage, predicting threats, and creating immersive experiences for public engagement. Collaborating with AI experts and leveraging innovative AI platforms can revolutionize heritage conservation strategies in Syria and beyond.

By implementing these recommendations, we can ensure the preservation of Syria's rich cultural heritage for future generations despite the challenging circumstances posed by conflict and instability.

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## The power of digitalization in education: improving learning with interactive multimedia content

### Сила цифровізації в освіті: покращення навчання за допомогою інтерактивного мультимедійного вмісту

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#### Abstract

The article highlights the advantages of creating multimedia content in education based on digitization. Programs for creating multimedia content in education on the basis of digitalization of multimedia were analyzed and the stages of working with them were considered, which were grouped by main categories. The most important characteristics of interactive multimedia are revealed. The importance of media competence and media literacy of the teacher and student has been proven. The necessity of creating multimedia content of a cloud-oriented educational environment in our time is shown. To achieve the goal of the research, an experiment was conducted, the purpose of which is to identify more effective multimedia technologies for providing multimedia content

#### Анотація

У статті виокремлено переваги створення мультимедійного контенту в освіті на засадах цифровізації. Проаналізовано програми для створення мультимедійного контенту в освіті на засадах цифровізації мультимедіа та розглянуто етапи роботи з ними, які згруповано за основними категоріями. Виявлено найважливіші характеристики інтерактивного мультимедіа. Доведено важливість медіакомпетентності та медіаграмотності викладача та студента. Показано необхідність створення мультимедійного контенту хмароорієнтованого навчального середовища у наш час. Для досягнення мети дослідження проведено експеримент мета якого виділити більш ефективні мультимедіа технології для забезпечення мультимедійного контенту на

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on the basis of digitization in the field of education, where an experimental approach is the most appropriate. As a result of an experimental study of the influence of multimedia content on the quality of assimilation of educational content by students of different age categories based on digitalization, the combination of multimedia tools in various combinations made it possible to reveal the characteristic features of the multimedia phenomenon in the modern world.

**Keywords:** multimedia content, education, digitalization, cloud-based educational environment, media literacy.

## Introduction

The most successful and developed countries, in our time of rapid changes, global informatization of society, and competition of specialists, direct their state policy in the direction of modernization of educational activities, namely, training of specialists capable of competing in the modern labor market, specialists of a new generation, capable in non-standard situations act and adapt to today's conditions.

The entire education system was radically affected by new information technologies, affecting the content of the educational field, methods, and forms of education, which in the "teacher-student" paradigm led to new requirements, namely, the possibility of effective use of technical and new ICT tools in education and professional activity, their strong potential today (Vanivska et al., 2018).

A person receives video, text, and graphic information throughout his life. One of the possible ways to solve the task of obtaining high-quality education is the digitalization of the educational process of higher education institutions, since it serves as a starting point for the implementation of innovations, is a center for the design of the latest technologies, contributes to socio-economic growth and generally ensures the development of any spheres of human life. Activity.

Based on the harmonization of education, in particular, the educational systems of European countries, the creation of a single European digital educational space is a complex and large-scale task today. Based on the European vector of development, the main directions of digitalization of education are: to create a digital learning environment – introduction and development of computer innovative, computer-oriented, and multimedia training tools and

zasadaх цифровізації у сфері навчання де найбільш доцільним є експериментальний підхід. В результаті експериментального дослідження впливу мультимедійного контенту на якість засвоєння змісту освіти учнями різних вікових категорій на основі цифровізації, поєднання мультимедійних засобів у різноманітних комбінаціях дозволили виявити характерні риси мультимедійного явища в сучасному світі.

**Ключові слова:** мультимедійний контент, освіта, цифровізація, хмароорієнтоване освітнє середовище, медіаграмотність.

equipment; for general access to educational institutions – creation of educational digital platforms and resources with support for multimedia and interactive content; development of a remote form of education using multimedia and cognitive technologies; organization of free access of education seekers to the Internet (Nesterenko, 2022).

Despite the information age as a new stage in the development of civilization, the subject of digitization of education cannot be considered sufficiently studied. There are a number of problems in the economy, politics and culture that require additional research efforts and intelligence. The information age actively and profoundly affects the educational process, it needs significant transformations, bringing it into line with the new requirements of the time.

A theoretical analysis of the practical experience of using digital technologies in the process of training students of higher education indicates the existence of contradictions between:

- the socially determined task of digitalization of education and science and the insufficient level of readiness of a significant part of higher education institutions of Ukraine for their implementation;
- the task of higher education institutions regarding the training of scientific personnel in the context of integration into the global scientific space and the insufficient level of development of the provisions of the theory and practice of digitalization of the process of training specialists under educational and scientific programs;
- the intensive development and spread of digital means of supporting scientific communication and the lack of students'

ability to carry out digital scientific communication.

Overcoming these contradictions requires the solution of a socially significant research problem, which consists in the need to develop and substantiate the theoretical and methodological foundations of the implementation and application of digital learning with the aim of forming an information-competent specialist.

In the article, we described the main aspects of digitization in education in order to improve learning with the help of interactive multimedia content: advantages of creating multimedia content in education based on digitization; programs for creating multimedia content in education based on digitalization of multimedia; the most important characteristics of interactive multimedia; media competence and media literacy of the teacher and student; creation of multimedia content in a cloud-oriented educational environment.

### Literature Review

Several authors, summarizing modern innovative processes in professional education, single out innovative, promising directions of digitalization of the educational sector, in particular: implementation of digital learning management systems, mixed digital learning systems; creation of appropriate digital platforms of information infrastructure with support for multimedia and interactive content, etc. Among such authors are N. Lazarenko, R. Hurevych, S. Kizim (2021).

In his research, V. Bykov (2017) notes that "the software and hardware basis of the digital transformation of society will be laid by the convergence of the most modern nano-, bio-, information, and cognitive technologies – NBIC Technologies, basic technologies of the knowledge society, and user- the technological basis is a global network of data processing centers built based on a cloud-oriented virtualized ICT infrastructure and personal electronic communicators." The scientist understands a personal electronic communicator as "a portable, compact, convenient and safe to use by a mobile user wireless electronic digital device that combines the functions of smartphones, pocket personal computers, and controllers, as well as means of radio frequency identification and GPS positioning".

In the process of distance learning, O. Vanivska, O. Malinovska, R. Presner (2018) considered the

possibilities of modern information and communication technologies and showed ways to improve distance higher education; discussed the role of a teacher and a student of higher education in the distance learning system based on the use of a multimedia approach, a wide range of ICT, which allows organizing a full-fledged educational interaction in the "teacher-student" paradigm. With this approach, the use of multimedia learning is the basis of modern ICT, and the basis of multimedia learning is multimedia content, one of the main and effective components of multimedia content is audio and video content.

T. Bondarenko (2022) considered video editors, programs for viewing videos, programs that allow you to convert files from one video format to another, and screen recording programs – the most popular and often used when editing, viewing, or transforming multimedia content. The analysis is given and the possibilities of software tools are described.

The analysis of the scientific works of O. Dushchenko (2021) made it possible to determine the most modern technologies – digital technologies, to characterize key concepts, to propose ways of using technologies (cloud environment, large volumes of data, robotics, quantum technologies, the Internet of Things, artificial intelligence, etc.) and gadgets, the Internet, modern personal computers, reveal the content of digitization, characterize the current state of digital transformation, show ways of using digital technologies; outline the directions of digitalization of education, show the advantages and highlight the existing problems of the digital transformation of education.

In the form of a list of skills, abilities, and knowledge that are used in assessing the level of digital competence of higher education students, I. Borodkin and H. Borodkin (2018) created a model of digital competence for students, which includes: information management (information storage, search, reproduction, review, and evaluation), cooperation supported by digital technologies, communication in digital environments (distribution of content and information, communication using digital means, civic activity on the Internet, digital identity administration, network etiquette), digital content for creativity (copyright, programming, creation of new knowledge, protection of intellectual property), security (protection of personal data, equipment, environment, health), problem-solving (finding ways and clarifying needs for their solution, solving technical

problems, creative use of technologies and innovations, self-assessment of digital competence).

L. Ivanova and D. Dzhabrailov (2022) carried out an analysis of the use of multimedia technologies in the educational process, conducted an experimental study on the influence of multimedia means of presenting educational content on the quality of assimilation of educational material; a diagnostic program was developed to conduct research. an experimental study was conducted among college students; experimental research made it possible to build a model of the interaction of participants in the educational process and to provide recommendations on the use of "methodology for creating high-quality educational content for certain categories of education seekers".

So, scientists have shown ways to improve distance higher education; discussed the role of the teacher and student of higher education in the system of distance learning based on the use of a multimedia approach; provided an analysis and described the possibilities of software tools, proposed ways of using technologies (cloud environment, large volumes of data, robotics, quantum technologies, Internet of Things, artificial intelligence, etc.) and gadgets, the Internet, modern personal computers; revealed the content of digitization, characterized the current state of digital transformation, showed ways of using digital technologies; to outline the directions of digitization of education; singled out innovative, promising directions of digitization of the educational sector, in particular: implementation of digital learning management systems, mixed digital learning systems; creation of appropriate digital platforms of information infrastructure with support for multimedia and interactive content; built a model of the interaction of participants in the educational process and provided recommendations on the use of "methodology for creating high-quality educational content for certain categories of education seekers". However, the process of creating multimedia content in education based on digitization is not fully disclosed.

*The purpose of the article:* creation of multimedia content in education on the basis of digitalization and research on the impact on the quality of assimilation of educational content by students of different age categories of multimedia content on the basis of digitalization, combining multimedia tools in various combinations, with the aim of highlighting the

characteristic features of the multimedia phenomenon in modern education.

### Methodology

To achieve the set goal, the following research methods were used: theoretical – to clarify the conceptual apparatus of the research – generalization and systematization of scientific sources, theoretical, scientific analysis of psychological-pedagogical, philosophical, methodical literature; definition and substantiation of the conditions for creating multimedia content in education based on digitization; analysis of regulatory documentation and modern practice of higher education institutions; formation of researched quality of multimedia content in education based on digitization; empirical: in order to determine the state of formation and dynamics of multimedia content creation in education on the basis of digitalization, a diagnostic toolkit was used in accordance with the defined structural components; pedagogical experiment – to check the effectiveness of the developed conditions for creating multimedia content in education based on digitization and the developed methodology for their implementation; methods of mathematical statistics were used to determine the statistical significance of the research results.

To fulfill the purpose of the research, it is necessary to experiment, the purpose of which is to identify more effective multimedia technologies for providing multimedia content in education based on digitalization in the field of education.

The most expedient, in our opinion, is the experimental approach, because it enabled the effectiveness of multimedia systems in educational content based on digitization in the "frontal" comparison of data acquisition. We proceeded from the reasoning that the more control questions and the more respondents there are to compare the degree of knowledge obtained, the "cleaner" the obtained data will be.

Testing was conducted several times to obtain more accurate results: the first testing was conducted after passing the material, and the second testing was conducted sometime later. Re-testing made it possible to eliminate the error in the field of knowledge of the applicants, and re-testing also helped to identify the features of multimedia in the respondents' memory. The obtained data provided the basis for identifying a more detailed impact of multimedia based on

digitization on the respondents' memory and for conducting further experiments.

After getting acquainted with the multimedia content based on digitalization, a diagnosis was made regarding the assimilation of the educational content by the participants of each experimental group. To confirm the results of the experimental study, a repeated diagnosis was carried out after a certain period. The results of the study of the impact on the quality of the assimilation of educational content by students of different age categories of multimedia content based on digitalization, combining multimedia tools in various combinations, made it possible to highlight the characteristic features of the multimedia phenomenon in modern education.

Research relies heavily on the accuracy and reliability of the data. In research work, the quality of data collection and analysis not only adds weight to the research, but also contributes to the formation of sound conclusions, which is the key to academic success.

The following digital data collection tools were useful in the study:

- Google Forms - a simple tool for creating surveys that allows you to collect data from respondents, create different types of questions and collect answers in spreadsheets.
- SurveyMonkey - a modern survey tool that offers a wide range of customization options and analytical tools for analyzing the collected data.
- JSTOR, Google Scholar, and other academic search engines to provide access to scholarly articles, books, and other academic resources that may be useful for literature review and theoretical data collection.
- Zotero or Mendeley - bibliography management programs that help organize research materials, store references, and format bibliographies and citations according to different citation styles.
- Microsoft Excel or Google Sheets - spreadsheets are useful for organizing and analyzing collected data when working with quantitative data.
- SPSS, R or Python for more advanced data analysis, for statistical analysis and processing of volumes of data.

When determining the sample of subjects, the general specificity of the subject of the study was taken into account. The total volume of the sample is 62 subjects. When forming the sample,

the criteria of meaningfulness, representativeness, and equivalence were taken into account. The sample was formed by random selection using the technical procedure for calculating the selection step.

The reliability and validity of the obtained results, the objectivity of their assessment was ensured by the methodological soundness of the initial positions and the qualitative mechanism for evaluating the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

To assess the homogeneity of experimental and control data, statistical processing was performed using MS Excel and SPSS (Statistical Package for Social Science).

## Results and Discussion

### Advantages of creating multimedia content in education based on digitization.

The study of the derivatives of the concept of "digitalization" and the concept itself proves that it appeared recently in the scientific environment and is connected with the large-scale penetration of information and communication technologies into the everyday life of modern society. Digital technologies allow the manipulation of data at high speed, including during transmission over continuous analog or digital communication channels (coding, analog-to-digital conversion, demodulation, and signal modulation) (Havrilova & Topolnyk, 2017). Since the modern information society requires fundamentally new approaches to obtain quality education, the scientific and technical progress, its rapid pace, makes it possible to take into account the implementation of a new and permanent digital revolution in the field of education. It is worth looking for ways and means of training highly qualified specialists, and new ways of educational space, in this context, which are capable of development, contribute to the introduction and spread of digital education, and possess the basics of digital literacy. Within the walls of a higher school, this task can be achieved through a qualitatively adjusted educational process.

The creation of multimedia content in education based on digitization makes it possible at the current stage of development of science, education, and technology to consider a

multimedia product as a form of educational content that occupies an important place.

To support and ensure that the content developers create an innovative educational process and update the educational material in the best quality, and that the students learn it effectively and innovatively, software tools for the development of multimedia products, video materials, composition, special effects, sound series, and coloristic solutions are aimed, their installation (Budnyk et al., 2022).

Among the advantages of creating multimedia content in education based on digitization is the possibility for individual users to reproduce it repeatedly at home. In the process of using the video, the user is allowed to adjust the playback of information fragments, control the demonstration of the video series, and stop it under certain conditions. Thus, already at the stage of self-training, we get the opportunity to provide an individual approach to learning, since students determine the most difficult sections for learning on their own, and this stimulates them to further in-depth study of the subject area (Bondarenko, 2022).

The emergence of multimedia tools and systems made a revolutionary leap in the creation of multimedia content in education based on digitization in our everyday lives and firmly took its positions in the field of science, education, and professional activity.

A few dozen years ago, multimedia tools were not used in the educational process, only static texts on paper media were used. Now, in the educational process, multimedia content in education based on digitalization plays a huge role, which cannot be overestimated in the era of rapid development of digitalization. This cannot be neglected, it must be taken into account in the educational context. With such an approach, the question of media competence and media literacy of the specialist who selects multimedia content and uses it – this or that informational content as needed for his course is at the fore, as well as the media literacy of students who for educational purposes are taken into account. use this media content (Mussoi et al., 2014).

The level of media culture is taken into account here, which refers to the ability to communicate and express oneself with the help of media, use information and communication technology, critically interpret information and consciously perceive it, separate reality from its virtual simulation, that is, understand the reality

constructed by media sources, effectively interact with the media space, as well as the ability to be a transmitter and carrier of media culture preferences, tastes, standards, to create new elements of media culture: videos, presentations, interactive maps, smart maps, slide shows, animations, illustrations, etc. (Peláez & Solano, 2023).

Readiness in the educational process to master modern computer technologies of higher education students and teachers (at a higher level than the level of a "simple user") is the most important thing in this case. Therefore, the media literacy of students of higher education and teachers, and their readiness for innovative educational activities is a qualitative main characteristic of a student of higher education, as a future highly qualified specialist and teacher of a higher school (Vanivska et al., 2018).

### **Programs for creating multimedia content in education based on digitalization of multimedia.**

Programs for creating multimedia content in education based on the digitalization of multimedia and work with them can be conventionally divided into the following main categories:

#### *1. Programs with which you can watch videos.*

We can single out the most effective of them for the educational space:

- Windows Media Player – a free file player for Windows: audio and video.
- BSPlayer – a media player for Windows that plays files in many multimedia formats, works with subtitles, differs in functionality, can independently download subtitles in the desired language, displays two pairs of subtitles on the screen at the same time, can automatically adjust the display of subtitles when the subtitles and video are out of sync;
- KMPlayer – player of video files and sound files for macOS and Microsoft Windows, there is also a mobile version for Android;
- Light Alloy – for playing video and audio files, this is free software. The program is optimized for minimal system loading and quick launch and has a small size.

#### *2. Editor programs, video editors – you can use them to edit videos.* Video editors differ among themselves in terms of interface, requirements for computer specifications, functionality settings, etc. For working with

video, the software includes a set of tools and functions that allow you to overlay music, apply special effects, and adjust frames (Zaluzhna & Nefiodova, 2020). Among the video editors, we will single out the most effective in the educational space:

- Pinnacle Studio is a video editor used for computer editing, which allows you to edit, process, create, and improve video files. Provides support for video in Ultra HD (4K) format and multi-channel sound, works with 3D content, authors Blu-ray discs, creates special titles and effects – provides a set of tools, provides a keying function, extended libraries of transitions, etc.;
- Adobe Premiere Pro – a professional non-linear video editing program from Adobe Systems;
- Sony Vegas Pro – a professional video editor for video processing and non-linear editing;
- Corel Video Studio is one of the most popular programs today, it is used for editing Microsoft videos and is a necessary Windows software package.

There are many functions in its arsenal for video editing: cropping, cropping, instant video correction, rotation, correction of the fish-eye effect and distortion in videos shot with a wide-angle camera, muting, video stabilization, direct upload to Vimeo sites and YouTube, audio mixing, etc.

3. *Screen recording programs – programs that help record user actions from the screen.* Among the digital tools for visualizing educational information, you can distinguish special software that allows you to record user actions from the screen. These programs include:
  - Bandicam – software that works on the principle of capturing an image from the monitor screen;
  - Camtasia is a versatile and powerful application used for video reviews, recording professional screencasts, educational presentations, or product demonstrations. The program, for further editing of the video document, has a significant set of tools and can record sounds and actions in any part of the Windows system;
  - UVScreenCamera – a functional and simple program for recording the monitor screen with sound. You can quickly create educational and demonstration videos, and presentations with the help of software;

- Screen Recorder is a Chrome extension for recording the screen that can be used for video instructions, recording video lessons, demonstrations;
- Screen recording in Google Chrome provides complete autonomy and creates an intuitive interface.

#### 4. *Programs that allow you to convert files from one video format to another.*

There are many ways to record, encode, and play video. For video conversion, the software allows you to convert the video file format in such a way that the file can be opened in a certain media player or the file size is reduced. The user can edit the codec and bitrate, resolution, and video conversion format.

The selection of the converter depends on the task: the files of which format should be received and the files of which formats should be converted.

The most effective programs in the educational space that can help convert files from one video format to another include:

- VideoProc Converter is a software complex equipped with a large number of convenient tools, including a video editor, media converter, video downloader, screen recorder;
- WinX HD Video Converter Deluxe is a software, with a large set of tools, universal support for publishing on the network, for appropriate (including HD) devices, for converting video files into various formats;
- MediaCoder – video and audio transcoder for Windows, which transcodes media files into various audio/video formats;
- VSDC Free Video Converter is a video converter with a large set of additional functions, which is universal and works flawlessly on all Windows systems.

It provides several options for video editing, and not only allows you to get high-quality conversion (Bondarenko, 2022).

#### **The most important characteristics of interactive multimedia.**

The most important characteristic of multimedia interactivity is the interaction between the machine and the user, where each of them plays an active role.

The advantages of interactive multimedia are that it is easy for the user to combine, manipulate, and control different types of media, such as computer graphics, text, animation, audio, and video materials (Correa Cruz et al., 2017).

Interactive multimedia combines the following information technologies: television, storage, data, telephone, computer, and others. The most effective interactive multimedia programs in the educational space include educational and educational programs, electronic encyclopedias, video games, and guides. The participant of the interactive educational multimedia program or the user changes his role – he becomes an active participant. Interactive multimedia systems will become the next generation of electronic information systems. Another name for interactive multimedia is Hybrid art – the art movement of the modern world, in which people of an artistic direction work with new technologies and advanced fields of science such as information visualization, artificial intelligence, physical sciences, robotics, biology, experimental interface technologies, etc.

In Tokyo, Japan, the Museum of Digital Art – the first in the world that amazes the imagination – has opened. It was created by hundreds of scientists and artists. The exhibits of the Museum of Digital Art interact with each other and with the viewer, "flowing" into each other. The works of digital art scientists combine carefully thought-out virtual spaces of various environments, and projection sounds, where imagination and fairy-tale fantasy border on reality.

The term hypermedia is sometimes used as a synonym for multimedia, but the definitions of these concepts are somewhat different.

Hypermedia refers to a technology that is used to combine programs on a network and various multimedia files. This practice is based on the concept of linking different text documents in the network using hyperlinks. Hypermedia links related content, which can consist of text, images, video, and animation, and takes this concept a step further (Brovchenko & Tymenko, 2023).

### **Media competence and media literacy of the teacher and student.**

Easier and faster reproduction of lexical-semantic connections in the human mind is provided by the use of multimedia content.

Here we can talk about the nominative-definitive function in educational multimedia content.

The video shows the peculiarities of the behavior of students of higher education, which is characteristic of their culture, helps to remember and understand the semantics of words thanks to a certain situation with the help of associative-semantic connections. Thus, the video provides an opportunity to demonstrate extra lingual components, which in education have an important informational load and the sound side of speech. The number of associative connections increases due to the specifics of the video image, and wider opportunities are opened for understanding the shown video or simple video text, which can be presented using animation, illustration, color selection, and underlining to establish certain associative-semantic connections with one or another video series.

The sound information displayed on the screen significantly expands the audiovisual information system in general and the concept of informativeness, in particular. If a person receives information using the organs of hearing and vision, then this information is perceived more effectively compared to information that comes to the student of education with the help of only vision or only hearing. Regardless of the age of the participants in the educational process, multimedia content is remembered much better. Therefore, the use of multimedia content in the educational process, compared to the standard study of academic disciplines, plays a key role (Anderson & Rivera-Vargas, 2020).

In the foreground, with this approach to education, there is the issue of media competence and media literacy of the teacher, who, as needed, selects and uses certain multimedia content, informative content for his course, as well as the media literacy of students of higher education who use this media content for educational purposes. First of all, we mean the level of media culture, which refers to the ability to communicate with the help of media, to express oneself, to use information and communication technology, to critically interpret and consciously perceive information, to separate reality from its virtual simulation, that is, to understand the reality constructed by media sources, as well as the ability to be transmitter and carrier of media culture preferences, tastes, standards, create new elements of media culture, effectively interact with the media space: slideshows, presentations, smart maps, videos, interactive maps, animations, illustrations, etc.

Of great importance in such an approach in education is the willingness to master modern computer technologies on both sides of the educational process at a high level, higher than the level of a "simple user") – both on the part of the student and on the part of the teacher. Therefore, the media literacy of a student of higher education and a teacher, their readiness for innovative educational activities is a qualitative main characteristic of a modern student and teacher, and as a result of the educational innovation process, it is a future highly qualified specialist (Vanivska et al., 2018).

### **Creation of multimedia content in a cloud-oriented educational environment.**

Figurative thinking is an important issue in innovative education, in which scientists and practitioners plan to create virtual reality programs including in the field of artificial intelligence.

A multimedia image embodies in its essence the interpretation of three tasks facing computer graphics:

- the creation of multimedia models of knowledge presentation should make it possible to make images of models as images of multimedia pictures, as objects for logical thinking that are operated by figurative thinking itself;
- visualization of human knowledge, for which it is impossible to find ways to transition to the formulation of some hypothesis about mechanisms and processes from multimedia images-pictures, which are hidden behind the dynamics of the image-picture, text, or audio description;
- the use of Internet resources, which is the main source of providing a higher education student from any field of activity with diverse information, has become widely used in education. Therefore, developers of Web pages need to use a wide range of possibilities of multimedia systems. One of the main criteria for creating a high-quality website with multimedia content is the use of appropriate graphic capabilities to create the most understandable display of information provided by the website and good design (Shuliak et al., 2022).

The modern educational environment and its constant development involve the transition to the use of software of cloud-based platforms, the

provision of services, etc. (Merzlykin & Semerikov, 2015).

Due to its flexibility and versatility, HTML5 is one of the main tools used by specialists to create educational electronic courses. Such multimedia content in education based on digitalization provides interactivity – the possibility of direct interaction with the user's software resource. Blended learning combines the classic classroom system with e-learning while using a multimedia content management system in education based on digitization. Blended approaches to learning provide an opportunity for a cloud-based learning environment to be an effective option for obtaining an education.

In the practice of the higher education institution and the research of scientists, the tools that teachers need to use to create multimedia content in education based on digitization, in particular, multimedia content of educational electronic courses based on HTML5, remain undefined.

In the e-learning environment, the software is called the term "Authoring Tools", which is intended for saving the resulting product in formats: Flash, HTML, SCORM, etc., designing electronic courses, and educational materials.

With the help of existing multimedia content management systems in education, it is possible to easily reproduce created materials based on digitization. H5P was developed in Norway by the Joubel company, and further development was dictated by the need to move away from the Flash format, which modern browsers do not support.

About 20 types of standalone HTML5 multimedia content compatible with the full range of touch-enabled devices and web browsers for tablets and phones are provided by H5P. Web pages may have embedded content that can be used for training. H5P makes it possible to create HTML5 content that is cross-browser and cross-platform for higher education students with an initial level of computer use.

H5P is a tool for creating HTML5 open educational resources based on digitization with such content as Chart, Collages, columns, Accordeon, audio, course Presentation, drag Text Fill in the Blanks, Summary, dialog Cards, find the Hotspot, image Hotspots, flashcards Guess the Answer, Interactive Video, Mark the Words, Single Choice, Memory Game, Multiple Choice, Appear.in, Twitter and Facebook User Feed, etc. The tool is open-source and freely distributed.

Based on digitalization, to use the tool, you have to:

- register on the H5P.org website;
- create your own multimedia content (for example, MOODLE), which can be placed using a tag in the content management system. In addition, H5P provides the ability to export and import H5P files in the h5p format, which is open, for efficient reuse of content;
- install the MOODLE plugin. Thus, in the content management system, when creating an activity, the option to select the H5P tool will appear. User evaluation results are available through the MOODLE evaluation log.

Therefore, H5P is a means of creating educational content for assessing students' knowledge and studying educational material with many possibilities. For one or another educational subject, instead of text fragments, the teacher can use multimedia electronic content, which is represented by objects that can be manipulated (Vorozhbyt, 2019).

Modern multimedia content in education is developed based on digitization with the help of multimedia technologies, which allows combining methods of processing different types of data into one computer system. The use of multimedia technologies in the educational process, perceived by the subjects of education, significantly increases the flow of educational information. Since not all information is assimilated, part of it does not find its place in those logical structures of a fragment or the entire educational content, the formation of which for an individual is the main goal of the educational process. Ensuring the educational process, and its planning, which involves the active use of visual images presented using multimedia technologies, should be based on the teacher's understanding of the concept of "information" (Ivanova & Jabrailov, 2022).

### **Experimental study.**

To fulfill the purpose of the research, an experiment was conducted, the purpose of which is to identify more effective multimedia technologies for providing multimedia content in education based on digitization in the field of education.

Multimedia tools, which are based on digitization are a component of multimedia content in

education, and multimedia educational resources can include:

- digital information: texts, diagrams, graphics;
- visual information: video, animation, image;
- audio information: music, speech, other sounds.

To conduct the experiment, a topic for training was selected – educational content for students of the same age category and level of training; prepared multimedia content based on digitization using multimedia learning tools: video lectures, presentations, audio lectures, etc., and also, for comparison, separately developed a test ordinary lecture.

Education respondents were divided into subgroups, each of the subgroups studied the topic in its own type of multimedia. A separate subgroup studied the topic of the lecture in the classical form. The participants of the groups, after familiarizing themselves with the educational content, launched the test program to check the level of knowledge of the respondents.

In the lecture material, to make the system of determining the effectiveness of education by students more effective, the same marker theses were added for each type of teaching. The more the respondents chose exactly marker theses during the test, the higher the level of attention to the presented material was considered.

The most expedient, in our opinion, is the experimental approach, because it enabled the effectiveness of multimedia systems in educational content based on digitization in the "frontal" comparison of data acquisition. We proceeded from the reasoning that the more control questions and the more respondents there are to compare the degree of knowledge obtained, the "cleaner" the obtained data will be.

Testing was conducted several times to obtain more accurate results: the first testing was conducted after passing the material, and the second testing was conducted sometime later. The purpose of such repeated testing is to determine whether there is an effect or impact on the long-term or short-term memory of a person in the types of multimedia and whether there is a difference in the long-term perspective of training specialists.

Re-testing made it possible to eliminate the error in the field of knowledge of the applicants, and re-testing also helped to identify the features of

multimedia in the respondents' memory. The obtained data provided the basis for identifying a more detailed impact of multimedia based on digitization on the respondents' memory and for conducting further experiments.

This approach to the experimental methodology allowed us to conduct a more in-depth study, such as:

- synergy of the learning topic and multimedia;
- synergy of multimedia with each other;
- the relationship between the age of the student and multimedia/learning topics based on digitalization.

We developed software to conduct an experimental study, namely:

- testing;
- justification of the stages related to the formation of multimedia content based on digitalization;
- a set of software modules for studying the effectiveness of multimedia educational content based on digitalization for education seekers;
- development of a model of interaction of experimental research participants with software;
- formation of analytical results of the experiment.

Each of the program modules contained a set of fragments of educational multimedia content based on digitization and was presented using testing and various multimedia tools for better learning. The results of the experimental study were processed by the analytical module.

The diagnostic software made it possible to use the developed templates of sets of fragments of educational multimedia content based on digitalization and to create their own multimedia tools in various combinations.

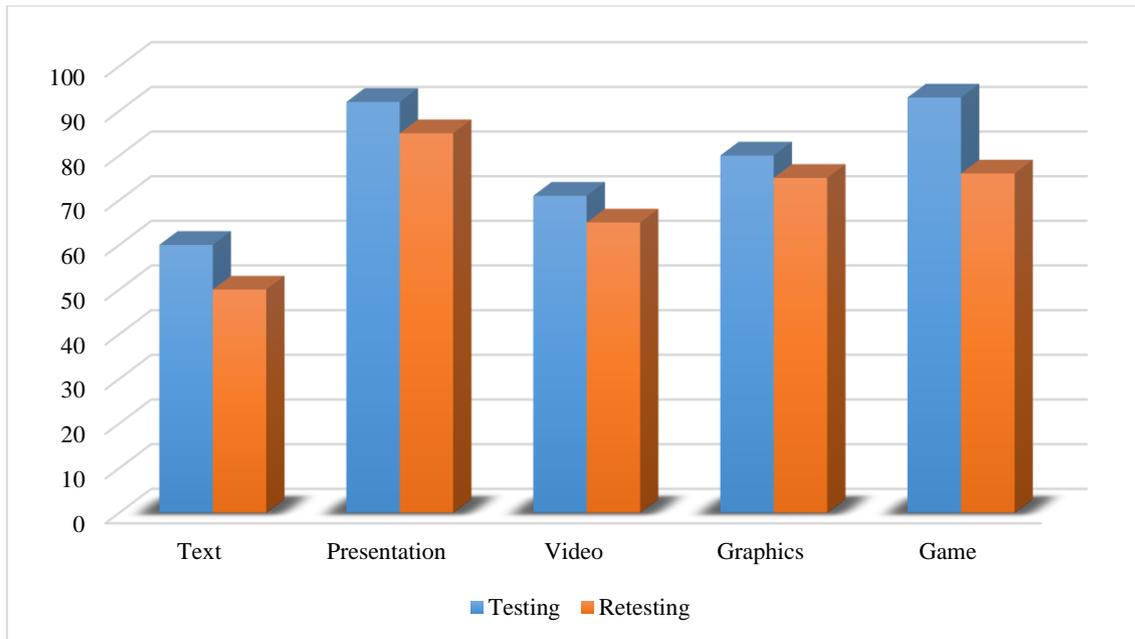
The template module of educational content fragments contained templates for creating educational multimedia content based on digitalization, in which the structure of educational multimedia content from educational blocks is formed based on digitalization to place the material being studied in the appropriate form: graphics, text, video, sound, games, hypertext, etc.

The module for creating fragments of educational multimedia content based on digitization made it possible to fill the educational content with educational materials by the selected template with the use of multimedia technologies, which gave higher education students access to educational content with further access to the diagnostic module, which allowed for the created fragments of initial content to create diagnostic tests and evaluate the level of assimilation of educational material by students of education.

The analytical module of multimedia content based on digitalization carried out analytics on the compliance of the level of assimilation of educational content created using various means of multimedia content based on digitalization.

A control group of respondents was divided into five experimental groups (EG). Each EG received a fragment of the educational content. The fragment was created using various multimedia technologies based on digitization (graphics, presentation, game, video) and a traditional textual fragment.

After getting acquainted with the multimedia content based on digitalization, a diagnosis was made regarding the assimilation of the educational content by the participants of each experimental group. To confirm the results of the experimental study, a repeated diagnosis was carried out after a certain period. The results of diagnostics regarding the quality of assimilation of multimedia content by students of education based on digitalization are presented in Figure 1.



**Fig. 1.** Results of an experimental study.

The results of the study of the influence of multimedia content on the quality of assimilation of educational content by students of different age categories based on digitalization, combining multimedia tools in various combinations, made it possible to identify the characteristic features of the multimedia phenomenon in modern education:

- the reality of the reality that is depicted: expressiveness, the display of phenomena in dynamics and development, the wealth of pictorial techniques, emotional saturation;
- information saturation: interactive mode of working with information, the possibility of combining information that is presented in different forms (sound, text, graphics, animation, video), and convenience of processing different types of information.

The use of multimedia technologies in the educational process of a higher education institution significantly increases the flow of educational information, which is constantly perceived by a student of higher education (Ivanova & Jabrailov, 2022).

The results of the research made it possible to identify the characteristic features of the multimedia phenomenon in modern education: the reality of the reality that is depicted: expressiveness, the display of phenomena in dynamics and development, the richness of pictorial techniques, emotional saturation; information saturation: interactive mode of working with information, the possibility of

combining information presented in different forms (sound, text, graphics, animation, video), convenience of processing different types of information.

It has been proven that H5P is the main tool for creating HTML5 open educational resources based on digitization with such content as: Chart, Collage, column, Accordeon, audio, course Presentation, drag Text Fill in the Blanks, Summary, dialog Cards, find the Hotspot, image Hotspots, flashcards Guess the Answer, Interactive Video, Mark the Words, Single Choice, Memory Game, Multiple Choice, Appear.in, Twitter and Facebook User Feed and more. The tool is open source and freely distributed. Due to its flexibility and versatility, HTML5 is one of the main tools used by specialists to create educational electronic courses. Such multimedia content in education on the basis of digitalization provides interactivity - the possibility of direct interaction with the user's software resource. In the e-learning environment, the software is called the term "Authoring Tools", which is intended for saving the resulting product in formats: Flash, HTML, SCORM, etc., designing electronic courses, educational materials.

## Conclusions

The advantages of creating multimedia content in education based on digitization are highlighted. Programs for creating multimedia content in education based on digitalization of multimedia were analyzed and the stages of

working with them were considered, which were grouped by main categories.

The most important characteristics of interactive multimedia are revealed. The importance of media competence and media literacy of the teacher and student has been proven. The necessity of creating multimedia content in a cloud-oriented educational environment in our time and taking into account imaginative thinking in innovative education, which scientists and practitioners in the plan of creating virtual reality programs are considered to be in the field of artificial intelligence, is shown.

To achieve the goal of the research, an experiment was conducted, the purpose of which was to identify more effective multimedia technologies for providing multimedia content in education based on digitization in the field of education.

The results of the study made it possible to identify the characteristic features of the multimedia phenomenon in modern education. H5P has been proven to be the premier tool for creating HTML5 open educational resources. The tool is open source and freely distributed. Due to its flexibility and versatility, HTML5 is one of the main tools used by specialists to create educational electronic courses. Such multimedia content in education on the basis of digitization provides interactivity.

The most expedient, in our opinion, is the experimental approach, because it enabled the effectiveness of multimedia systems in educational content based on digitization in the "frontal" comparison of data acquisition. We proceeded from the reasoning that the more control questions and the more respondents there are to compare the degree of knowledge obtained, the "cleaner" the obtained data will be.

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After getting acquainted with the multimedia content based on digitalization, a diagnosis was made regarding the assimilation of the educational content by the participants of each experimental group. To confirm the results of the experimental study, a repeated diagnosis was carried out after a certain period. The results of the study of the impact on the quality of the assimilation of educational content by students of different age categories of multimedia content based on digitalization, combining multimedia tools in various combinations, made it possible to highlight the characteristic features of the multimedia phenomenon in modern education.

Further research is needed to justify ways of using virtual reality programs in education.

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## Digital educational environments: strategies and tools for training competent professionals

Цифрові освітні середовища: стратегії та інструменти підготовки компетентних фахівців

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### Abstract

The article highlights digital educational environments, describes strategies and tools for training competent specialists. Ways of using digital technologies in education and their didactic possibilities are revealed, key characteristics are listed. The purpose and tasks of the digital educational environment of educational institutions of modern society are specified. The process of building a digital educational environment of an educational institution is shown. The most important software of the information system of professional training, which should be in the information and digital educational environment of the educational institution, is highlighted. The necessary conditions and organizational principles of creating an effective digital educational environment of an educational institution are substantiated. The main goals and recommended tasks regarding the formation of a digital

### Анотація

У статті висвітлюються цифрові освітні середовища, описуються стратегії та інструменти підготовки компетентних фахівців. Розкрито шляхи використання в освіті цифрових технологій та їх дидактичні можливості, виписано ключові характеристики. Зазначено мету та завдання цифрового освітнього середовища закладів освіти сучасного суспільства. Показано процес побудови цифрового освітнього середовища закладу освіти. Виділено найголовніше програмне забезпечення інформаційної системи професійної підготовки, що має бути в інформаційно-цифровому освітньому середовищі закладу освіти. Обґрунтовано необхідні умови та організаційні принципи створення ефективного цифрового освітнього середовища закладу освіти. Запропоновано основні цілі та рекомендовані завдання, щодо формування цифрового освітнього середовища

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educational environment in an educational institution are proposed. An experimental study was conducted to find out the level of digital competence of future specialists and the role of the digital educational environment in the educational institution.

**Keywords:** information and digital educational environment, educational institutions, digital competence, digital resources, information technologies.

## Introduction

Digital technologies serve as a potential for stimulating more inclusive and sustainable development and stimulating innovation, contribute to increasing the efficiency of educational services. Today, it is important to take advantage of the digital transformation, which contributes to the creation of jobs and provides access to educational services, as well as allows solving potential problems (Ovcharuk et al., 2022).

Today's realities require not only a high level of education of specialists, but also a new type of intelligence, way of thinking, speed in communication and professional mobility and digital competence. This will ultimately change their attitude to the rapidly changing economic, technological, social and informational factors of production and the surrounding world.

Conceptual changes in the system of professional education are prompted by the wide spread of new digital technologies, in particular: distance learning, personalization of data, virtual classes, cloud and Internet technologies, autonomous learning and information consulting. Successful modernization of educational systems with the use of digital technologies is possible under the conditions of the implementation of many projects, one of which is the creation of a unified information environment of the educational institution, which will provide effective support in the professional formation of specialists (Shynkariova, 2022).

The introduction of digital technologies into the educational process and its digitization allows the implementation of a new format of education.

In the modern educational situation, there are a number of contradictions between:

- the need to introduce innovations caused by the processes of digitization and European

у закладі освіти. Проведено експериментальне дослідження з метою з'ясування рівня цифрової компетентності майбутніх фахівців та роль в цьому цифрового освітнього середовища у закладі освіти.

**Ключові слова:** інформаційно-цифрове освітнє середовище, заклади освіти, цифрова компетентність, цифрові ресурси, інформаційні технології.

integration, a significant amount of accumulated domestic and foreign experience in the organization of the institution's information environment, and the degree of theoretical substantiation of the scientific and methodological foundations of its introduction into the practice of the educational institution;

- requirements for the level of digital literacy of teachers and students and the degree of formation of the level of readiness of subjects of the educational process in the information environment of the educational institution;
- the leading importance of information activity in the provision of quality educational services and the insufficient development of theoretical and methodological support for its organization within the digital environment of the educational institution (Tkachuk, 2015).

Considering the issue of digital technologies, in the article we considered the main aspects of the problem of digitalization in the training of specialists, namely: ways of using information technologies in education and their didactic possibilities and key characteristics; the tasks of the information and digital educational environment of educational institutions of modern society; the process of building an information and digital educational environment of an educational institution; necessary conditions and organizational principles for creating an effective information and digital educational environment of an educational institution; the main goals and recommended tasks regarding the formation of the information and digital educational environment in the educational institution; experimental investigation of the level of digital competence of future specialists and the role of the information and digital educational environment in the educational institution.

## Literature Review

The system of designing the info and digital educational environment of the establishment of higher education in modern society was considered by M. Topuzov (2018), the conceptual approaches to the educational institution, the construction of its SMART model, the content and its structure of the institution, the advantages of the introduction of information management systems, software, information technologies are shown. free social tools for education (Tools for Learning).

The same problem is investigated by O. Ovcharuk, O. Hrytsenchuk, I. Ivaniuk, L. Kartashova, O. Kravchyna, M. Leshchenko, and I. Malytska (2022). Scientists have analyzed the theoretical and organizational modern methods to the development and construction of the information and digital educational environment of the educational institution. The components of such an educational atmosphere are characterized by the conditions of global education reform; a model of the information and digital educational environment of general secondary education institutions was developed, organizational and pedagogical conditions were identified.

Y. Zavalevskyi, N. Gushchyna, I. Vasylashko, O. Korshunova, and O. Patrykeieva (2022) determined the conditions for the implementation of the research method of teaching using STEM technologies and information technologies in institutions of general secondary education: on the basis of the research method of teaching, the creation of modern educational content and STEM approaches, improvement of the content of educational support; creation, for the training of teachers, of scientific and methodological support and acquisition of practical experience based on STEM and IT approaches for the growth of research capability of education seekers; participation of school teams in various motivational activities of the research direction and STEM.

V. Bykov, D. Mikulowski, O. Moravcik, S. Svetsky, and M. Shyshkina, (2020) examine and justify the importance of a computer-oriented educational environment and divide it into closed and open, the first of which at this stage prevailed in educational institutions and received significant development in universities.

N. Vodopian (2023) proposed means of creating a cloud-oriented educational environment. The educational programs developed by him for the

subjects of the technological and natural-mathematical cycle of secondary schools have an experimental component, which students implement through practical and laboratory work. The scientist proved that in the didactic process of natural sciences, the use of an educational independent experiment is a psychologically and pedagogically confirmed and substantiated educational practice.

The same problem is also investigated by S. Lytvynova (2015), who developed the theoretical and methodological foundations of designing a cloud-oriented educational environment in a general educational institution, outlined the features of the communication-organizational component of a cloud-oriented educational environment, and revealed the functioning of the spatial-semantic component, defined the component model of the general educational institution, in particular, a cloud-oriented educational environment.

M. Sherman, Ya. Samchynska, Yu. Korniienko (2021) grouped the development of the information system and the main stages of professional training of higher education students and distinguished the ways of designing, described the process of the web system interface, architectural design, developed prototypes of the main pages of the system, developed a scheme of the website; provided the structure of the database and provided its description, substantiated the technologies used in the process of developing the information system of professional training. PHP was chosen as the programming language, WordPress CMS was used for development. The information system for professional training of students presented by the authors, a feature of which for those seeking higher education is the development of a parser for automated filling of the database of educational resources, thereby reducing the need for manual filling of the information system by users, which allows improving the process of updating materials for students.

In order to improve the quality of training of future teachers of preschool education institutions, V. Shynkariova (2022) made an analysis in a higher education institution of the theoretical foundations of the formation of a digital educational space; in order to improve the quality of professional training of future teachers of preschool education institutions, she carried out a theoretical analysis of the conceptual foundations of the formation of a digital educational space, highlighted the impact of

information and communication technologies on the expansion of the content and opportunities of the educational space, developed tasks that improve the educational process and, through the introduction of innovative information systems, affect the quality training of future educators.

As a result of the analysis of scientific research from a specific direction, we note that in modern society, scientists are engaged in the systematic design of the information and digital educational environment of a higher education institution, developed conceptual approaches to an innovative educational institution, built its SMART models; determined the conditions for the implementation of the research method of education using STEM technologies and information technologies in institutions of general secondary education; justified the importance of a computer-oriented learning environment; developed means of creating a cloud-oriented educational environment; grouped the development of the information system and the main stages of professional training of higher education applicants; distinguished the ways of design, described the process of the web system interface, architecture design, developed prototypes of the main pages of the system and the scheme of the website.

***The purpose of the article:*** to characterize the information and digital educational environment of the educational institution and show its necessity in the world space, to find out the level of digital competence of future specialists and the role of the information and digital educational environment in the educational institution.

The methodological basis of the research is the theory of scientific knowledge; complex of principles, approaches, provisions, unity of theory and practice; axiological, cultural, ethical, activity, system, personal approaches; holistic approach to the analysis of personality formation.

### Methodology

The research is based on the use of a complex of the following methods: historical method for studying scientific and pedagogical literature; logical method – to identify objective regularities in the creation of a set of judgments and concepts in the formation of their content; method of induction and deduction – for gathering theoretical and factual material; the method of comparison and comparison – in order to determine the differences and similarities of the main research concepts; analysis and synthesis – for specification, methods and forms, meaningful

content of the learned experience, as well as empirical: observation, survey of respondents – to find out the level of digital competence of future specialists and the role of the information and digital educational environment in the educational institution.

An experimental study was conducted to find out the level of digital competence of future specialists and the role of the information and digital educational environment in the educational institution.

During the experimental work, we developed questions for the determination of self-assessment by future experts – students of higher education, aimed at clarifying the level of their digital competence and the role of the information and digital educational environment in the educational institution. Questions were formed based on international approaches, in particular on the basis of the document "Digital Competence Framework for Citizens: Eight Levels of Mastery with Examples of Use" (DigComp 2.1: Digital Competence Framework for Citizens). The digital competence framework includes such levels: professional user, independent user, basic user. The Digital Competence Framework includes five areas of this competence: digital literacy and information, digital content creation, collaboration and communication, problem solving, and safety. The respondents' self-assessment was built on these levels and areas during this study. 179 respondents took part in the survey.

The purpose of the review was to reveal the defiance of those seeking education to the use of the information and digital educational environment of the educational institution, the ability of the respondents to create multimedia content in various formats, to reveal the opinion about the most effective digital tools, to increase the level of digital competence of future specialists, to develop the facility to explain difficulties when using digital technologies, which arise, etc.

The general changing aspects of increasing the level of digital competence of future specialists is not intensive enough, they do not actively create their own digital resources and use the information and digital educational environment of the educational institution, they do not use a wide enough range of ICT, they do not have the skills to protect personal information and devices, in most activities remain passive about the safe use of digital resources.

The respondents who answered the questions of the online survey noted that the attitude of the education seekers to the use of the information and digital educational environment of the educational institution, the ability of the respondents to create multimedia content in various formats, to express their opinion about the most effective digital tools, to increase the level of digital competence of future specialists, to form the ability to use digital technologies to solve problems that arise, etc. is not effective enough. Respondents attribute the following to the main problems: weak provision of high-speed Internet connection, inadequate access by educational institutions to digital devices and inadequate management of access to IT infrastructure.

## Results and Discussion

The information and digital educational environment of an educational institution embodies in its concept "an ordered set of components for the development and self-development of spatially distributed subjects of pedagogical communication and information interaction mediated by means of information and communication technologies" (Familiarska, 2016).

Characterizing the information and digital educational environment of an educational institution, scientists consider it as "an open or closed ICT educational environment of pedagogical systems, the main didactic functions of which are the pedagogically expedient coordinated and integrated use of computer-oriented teaching aids, electronic educational resources and open or closed services information and communication networks focused on the needs of participants in the educational process". The information and digital educational environment of an educational institution is considered as "a systemically organized set of information, technical, educational and methodological support of educational institutions aimed at organizing the interaction of education seekers, teachers, school leaders and the public, as well as at the implementation of educational and educational influences that are supported digital means of data collection and transmission, hardware and software, and educational and methodological support. The information and digital environment of an educational institution is part of a single information space, which was formed as a result of a certain evolution of various resources, systems, structures, databases,

subjects of interaction and other factors in a global context (Ovcharuk et al., 2022).

Solving the issue of designing a high-quality information and digital educational environment of an educational institution involves the complex formation of a unified information system in the educational institution, necessary through the creation of a communicative corporate infrastructure, a network of its divisions, which involves the use of computer and information technology, modern digital equipment, high-quality software tools with the integration of current information systems into the educational complex of technical solutions, design, software products involved in the environment, the creation of a management system for the development of education (Kharchenko & Shyshenko, 2021).

Therefore, the information and digital educational environment of an educational establishment is an innovative open scheme with means of information protection, where interconnected subjects of educational activity participate at the information level: students of education, scientific and pedagogical workers, administration, educational management bodies, pedagogical the public, etc.

Practically all participants of educational interaction create an information system with the corresponding information flows among themselves.

The updated political initiative of the European Union is the „Digital Education Action Plan (2021-2027)“ (2020), presented by the European Commission (2020) which sets out a shared vision for accessible and high-quality digital education in Europe, aimed at supporting Member States' learning systems for the digital age and adaptation of education.

In the political guidelines of the EU (2019-2024), one of the priority directions is emphasized:

- compliance of Europe with the modern level of digital technologies;
- on the use of mass open online courses;
- on the role of education in the implementation of innovative plans, thanks to which the skills of people of any age and their capabilities are expanded;
- on modern approaches to learning using educational materials, online resources;
- on the development and mastery of digital literacy, digital skills of citizens of different age categories.

Research conducted recently by the European Commission (2020) showed that: do not have digital skills, do not own digital technologies – 43% of citizens of European countries. And today, 90% of jobs require basic digital skills (at least minimal).

Digital education of the world is becoming one of the key directions of the development strategies of all countries, one of the priority directions of the development of the education system.

In order to assess the state of digital education in European countries and analyze it, the Eurydice educational network conducted a study in 2019 entitled: Digital Education at School in Europe.

During the study, it was determined that, in accordance with the quick step of the spread of information technologies, digitalization of society (43 education systems participated in the study, of which 28 are member states of the European Union), digital education strategies were developed and are being implemented in almost all countries. Mainly in the countries of South-Eastern and Eastern Europe – digital education is included in larger-scale state strategies; mainly in Central, Western, Northern Europe – 18 education systems have their own digital education strategy (Ovcharuk et al., 2022).

### **Ways of using information technologies in education and their didactic possibilities and key characteristics.**

Ways of using information technologies in education are:

- creation of information and digital educational environments of educational institutions;
- the use of IT in the management of an educational institution;
- creation of pedagogical software products;
- development of distance courses;
- creation of websites of educational institutions;
- creation of electronic libraries, media libraries, etc.

At the same time, it is worth highlighting didactic IT opportunities – positive and negative.

The positive ones include: consolidation of educational information; differentiation and individualization of education; ensuring the connection of practice, theory and management

of cognitive activity; development and formation of the information culture of the individual; formation of the general culture of thinking and creative qualities of the acquirers of the educational space; creation of conditions for self-realization of the individual; ability to solve media education problems, etc. (López de Parra et al., 2017).

The negative ones include – the feeling of isolation on the part of the students of education; when studying imprecise disciplines, help is impossible, formal procedures and rules cannot be applied (religion, philosophy, sociology, etc.), etc. (Kademiia & Shahina, 2011).

Let us name the key characteristics of the information and digital educational environment of educational institutions of modern society:

- informational needs of a person;
- knowledge, knowledge economy,
- information space;
- information resources and networks;
- information products;
- information technologies;
- information processes, informatization process;
- IT support of various processes, etc.

In the process of designing objects of the information and digital educational environment of educational establishments of modern society, it is pedagogically appropriate and possible to use the following teaching tools:

- gamification of the scientific, educational, research process using methods that, taking into account the specifics of game thinking, are applied in the educational space, are characteristic of computer games in the non-game space. This approach makes it possible to receive measurable feedback, provides a step-by-step immersion of the learner in the learning process, dynamically adjusts the learner's behavior in the educational space;
- interactive and multimedia technologies for forecasting studied phenomena and processes, modeling and experiments;
- for the joint formation and use of collective knowledge of social media (blogs, social networks, tags, social multimedia, wiki-projects, bookmark services, social search systems, multiplayer network games, social geo-information systems, virtual worlds, etc.).

In the process of designing the information and digital educational environment of educational

institutions of modern society, it is important to foresee the creation on the foundation of current integrated solutions for the ground of education – information model, information architecture, management of information resources, concepts of information, m-Learning and m-Science approaches, effective information and organizational – economic mechanisms, principles of Social-Mobile-Access-Regulated-Technology, programs for the introduction of modern innovations and technologies, informatization of educational institutions (Ligarretto Feo, 2022).

The analysis of many years of experience and the best foreign practices in the field of education regarding the search for integrated solutions in it in the conditions of a developed information society makes it possible to form conceptual approaches to the construction of SMART educational institutions and environments for their functioning, a smart university – a SMART university based on the principles Social-Mobile-Access-Regulated-Technology (Topuzov, 2018).

#### **The tasks of the information and digital educational environment of educational institutions of modern society.**

The tasks of the information and digital educational environment of educational institutions in modern society are:

- support and provision of the organizational conditions of the educational process of the educational institution in modern society;
- providing access to distance learning resources and tools for education seekers;
- storage and accumulation of teaching-methodical and educational materials and content in free access for education seekers, psychologists, teachers, other pedagogical workers;
- promoting the creation of digital ability in subjects of the educational development;
- unification of educational activities and digital tools;
- support of communication and social interaction;
- providing access to web-oriented secure tools of the educational process;
- support for self-education activities of teachers and students;
- provision of learning conditions for those seeking education and a health-preserving environment for them;
- provision and support of feedback between applicants for educational space, teachers, institution administration;
- opportunities to build an individual educational trajectory;
- support for access to educational online resources, which is safe;
- support for monitoring the effectiveness of the implementation of the educational process and control of educational achievements of education seekers, etc.

#### **The process of building an information and digital educational environment of an educational institution.**

Let's consider the steps of the process of building an information and digital educational environment of an educational institution, which should provide that organizational and scientific-methodical support will help to achieve the set goal in accordance with the level of education, will ensure the educational process in the educational institution in accordance with the educational and educational needs of the students of the educational process and teachers, with the aim of providing high-quality educational services, means of distance learning, information and communication (digital) technologies and equal access of higher education seekers to digital information resources.

1. The social and communicative component of the informational and digital educational environment of the educational institution. The implementation of this very component in an educational institution is important for: establishing communication links and feedback between the administration of the institution, teachers and students of education, as well as for ensuring a safe and comfortable, health-preserving and confidential stay of students of education in this environment, which will attract them to participate in educational activities, motivate them to communicate and study, participate in the life of the institution where they study.
2. The technological component of the information and digital educational environment of the educational institution. This component includes in its content: cloud services, electronic educational resources, etc.
3. The organizational and operational component of the information and digital educational environment of the educational institution. this component is intended to ensure the organization of the activities of the subjects of the educational process in a digital format; is an important component of the environment; ensures a coordinated

educational process using ICT; contributes to the fulfillment of educational tasks.

Thus, in the information and digital educational environment of the educational institution, documents must be placed for the purpose of high-quality and timely planning of the educational process: educational and thematic plans, educational programs, electronic magazine, class schedules and other resources; basic information about the educational institution and information that ensures the openness and transparency of the institution's activities and its mode of operation are presented.

Of great importance in the information and digital educational environment of an educational institution are resources containing: methodical recommendations using ICT regarding the organization of methods and forms of education; features of control and monitoring of educational achievements of education seekers; sequence of tasks, work in inclusive groups, etc. (Manrique-Losada et al., 2020).

Also, educational simulators that can be used independently during remote classes, virtual classrooms, and virtual laboratories should be organized in the educational institution's information and digital educational environment. These tools support business educational games and facilitate extracurricular activities, classes, and practical tasks. The information and digital educational environment of the educational institution must provide access to informational messages and resources, such as video and audio recordings of lectures that contain ready-made student products in digital format (Ovcharuk et al., 2022).

Let's highlight the most important software of the information system of professional training, which should be in the educational institution's information and digital educational environment.

The following programming technologies were used to develop the information and digital educational environment of the educational institution:

- code editor Visual Studio Code;
- PHP;
- assembly of the local XAMPP web server;
- CMSWordPress.

To use the created information system of the information and digital educational environment of the educational institution, it is enough to have

basic computer skills and it is not necessary to have special knowledge (Sherman et al., 2021).

One of the tasks of ensuring the effective functioning of the professional training information system, and its key directions, was the creation of a means of updating educational materials and automatic filling. Such a tool for an information system is a parser, a program that selects information according to a certain algorithm, performs syntactic analysis of websites, and saves the results for further display in a structured form. Special libraries and PHP programming languages (cURL and SimpleHTMLDOM) were used to develop the parser. The ArticlesScrap parser, which can be used on any website, was developed as a plugin for the WordPress content management system (Sherman et al., 2021).

The growth of an info scheme database is of great importance in the information and digital educational environment of an educational institution. CMSWordPress uses MySQL for its database management system.

The phpMyAdmin software is used for convenient database management, providing the student with access to the graphical web interface.

The WordPress system creates a database and structure on its own, which can be used immediately and, if necessary, expanded. Installed plugins also can create new tables, which are important for efficient work, and access to the database. The WordPress database that is created contains the following tables:

- the table in which metadata is stored for all comments that were not deleted on the site and were left - *wp\_commentmeta*;
- the table used in earlier versions of WordPress to manage blogrolls or through the LinkManager plugin - *wp\_links*;
- the table in which all comments and their data are stored, in particular, the record identifier, the identifier of the comment to which the comment was left - *wp\_comments*;
- the table that stores most of the site's settings (URL address, date and time format, number of entries on the page, administrator's e-mail address, etc.) - *wp\_options*. Some plugins also use this table to store their settings;
- the table that stores all kinds of custom types of records, pages - *wp\_posts*;

- the table stores metadata about pages, records, and custom types of records – *wp\_postmeta*;
- the table in which metadata (tags, categories, links) are stored for taxonomies – *wp\_termmeta*;
- the table that stores associative relationships between tags, categories, and records – *wp\_term\_relationships*;
- the table that stores the data of users registered in the system (usernames, roles, biography, etc.) – *wp\_usermeta*;
- the table that stores the relationship between categories and tags, the nesting of categories, and their description – *wp\_term\_taxonomy*;
- the table containing user data: password, registration date, login, e-mail – *wp\_users*;
- the custom table in which information about the frequency of the parser launch is long-term stored – *wp\_scrap\_options*;
- the table with information about articles obtained by parsing, that is, a custom table. The data of such a table is used to prevent duplication of entries – *wp\_articles*.

Almost all tables have relationships with other tables, which are implemented using special fields, and are within this database. However, the *wp\_options* table is just one table that has no relationship with the others because it stores information about WordPress and site settings that are not related to users or records (Sherman et al., 2021).

#### **Necessary conditions and organizational principles for creating an effective information and digital educational environment of an educational institution.**

As evidenced by the research results, it is necessary to observe several conditions to create an effective information and digital educational environment of an educational institution:

- provide open access to the global Internet network, information channels of the internal local network, to media library resources;
- creation of opportunities for implementation of communication and information technologies in practice;
- to increase the quality level of the submission of new material – active use of digital technologies of the activity type and methods of project-research activity (Kidd, 2019).

Let's consider the generalized organizational principles of creating an effective information and digital educational environment of an educational institution to improve the quality of training future specialists (Shamraliuk, 2017):

- *uniformity* – the coordinated implementation in a technological, educational, unified logic of a variety of digital technologies that solve specialized problems in various spheres of the educational environment;
- *accessibility*, as a principle of unlimited functioning of non-commercial components of the digital educational space and commercial ones, through the use of the global Internet network, in compliance with license conditions, the requirements of education standards for each specific student of education;
- *openness* to interaction and replenishment of the complex of educational innovative technologies with actual digital ones;
- *competitiveness* – as a potential possibility of partial or complete replacement of the information and digital educational environment of the educational institution by competing systems, platforms, and technologies;
- *validity* – the principle of compliance with the capabilities and powers of the subject of the educational process, the composition of the information system to the goals, without the introduction of redundant data structures and the performance of redundant functions that require unjustified costs for their support;
- *responsibility* as a right, to participate in the coordination of tasks, the opportunity and obligation of each student of education to solve the tasks of informatization, and exchange of information with related information systems;
- *usefulness* – as a basis for reducing the labor costs of the user of the information and digital educational environment of the educational institution and, due to the implementation of the digital educational space, the formation of new opportunities.

#### **The main goals and recommended tasks regarding the formation of the information and digital educational environment in the educational institution.**

In the context of creating an effective information and digital educational environment of an educational institution, and improving the quality of professional training of future specialists, we analyze the main goals of forming

an information and digital educational environment in a higher education institution:

- 1) for education seekers:
  - access to the most modern educational resources;
  - expanding the possibilities of building an educational trajectory;
  - erasure, on a global scale, of the boundaries of educational organizations;
- 2) for customers of educational services:
  - increasing the transparency of the educational process;
  - expansion of educational opportunities;
  - formation of new conditions for motivating students when creating and completing tasks;
  - facilitation of communication with all participants of the educational process;
  - increasing the convenience of monitoring the educational process;
  - implementation of control over students' success through automation;
  - formation of new opportunities for the organization of the educational process;
- 3) for the provider of educational services, educational institution:
  - due to the transfer of a part of the load to digital technologies – increasing the efficiency of resource use;
  - due to automation – reducing the workload on personnel;
  - at the expense of the network organization of the process – expanding the possibilities of the educational offer.

For effective functioning of the information and digital educational environment of the educational institution, we recommend performing several tasks (Morze, 2019):

- to develop new principles of data processing and regulations in the conditions of the transfer of document circulation to a digital format, taking into account the principle of moderation at all levels of process management and taking into account the requirements for the protection of personal information;
- revise the regulatory framework for the organization of the educational process and document flow to eliminate conflicts between modern electronic document flow and previous norms;

- approve as an industry standard and develop data exchange protocols;
- to develop the architecture of the information and digital educational environment in the educational institution, which allows for expansion of the composition and flexibly replaces the systems in its composition;
- compile a list of data that is constantly used in the field of education for exchange.

The formation of an information and digital educational environment in an educational institution allows educational institutions to provide a smooth solution to the problems of information transfer to the subjects of the educational process, storage, and retrieval. Educational institutions can now accumulate essential information resources in electronic form, the active digitization of which will have a positive effect on the quality of training of future specialists (Castro-Benavides et al., 2022).

Simplified access to the global Internet and the spread of personalized digital services bring new didactic and technical opportunities to the field of education. In particular, this is access to significant amounts of information, simplification of dialog communication, and the possibility of visualization, which allows the growing generation to form digital literacy in a complex (Shynkariova, 2022).

### **Experimental investigation of the level of digital competence of future specialists and the role of the information and digital educational environment in the educational institution.**

During the experimental work, we developed questions for self-assessment by future specialists – students of higher education, aimed at clarifying the level of their digital competence and the role of the information and digital educational environment in the educational institution. Based on international approaches, questions were formed, in particular based on the document "Digital Competence Framework for Citizens: Eight Levels of Mastery with Examples of Use" (DigComp 2.1: Digital Competence Framework for Citizens) (Bykov et al., 2020). The digital competence framework includes such levels: professional user, independent user, and basic user. The Digital Competence Framework includes five areas of this competence: digital learning and information, digital content formation, collaboration and communication, problem-solving, and safety (Ovcharuk et al., 2022).

When determining the sample of subjects, the general specificity of the subject of the study was taken into account. The total sample size is 179 subjects. When forming the sample, the criteria of meaningfulness, representativeness, and equivalence were taken into account. The sample was formed by random selection using the technical procedure for calculating the selection step.

The reliability and validity of the obtained results, the objectivity of their assessment was ensured by the methodological soundness of the initial positions and the qualitative mechanism for evaluating the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

To assess the homogeneity of experimental and control data, statistical processing was performed using MS Excel and SPSS (Statistical Package for Social Science).

Research relies heavily on the accuracy and reliability of the data. In research work, the quality of data collection and analysis not only adds weight to the research, but also contributes to the formation of sound conclusions, which is the key to academic success.

The following digital data collection tools were useful in the study:

- Google Forms - a simple tool for creating surveys that allows you to collect data from respondents, create different types of questions and collect answers in spreadsheets.
- SurveyMonkey - a modern survey tool that offers a wide range of customization options and analytical tools for analyzing the collected data.
- JSTOR, Google Scholar, and other academic search engines to provide access to scholarly articles, books, and other academic resources that may be useful for literature review and theoretical data collection
- Zotero or Mendeley - bibliography management programs that help organize research materials, store references, and format bibliographies and citations according to different citation styles.
- Microsoft Excel or Google Sheets - spreadsheets are useful for organizing and analyzing collected data when working with quantitative data.

- SPSS, R or Python for more advanced data analysis, for statistical analysis and processing of volumes of data.

The respondents' self-assessment was built on these levels and areas during this study. 179 respondents appropriated fragment in the study.

The following questions were asked.

1. "Do you experience problems while receiving information?" we heard the following responses:
  - 20% of experiment participants search for information on the Internet using a search engine - basic user level;
  - 41% of research participants emphasized that all of them can use different search engines to search for information - independent user level;
  - 39% of students freely use advanced search strategies to find information on the Internet - professional user level.
2. "When searching for information, is it easy for you to assess its reliability?":
  - 30% of research participants used information online and considered it not entirely reliable - basic student level;
  - 25% of the participants of the experiment use filters when searching for information to check the reliability of the information found - the level of an independent respondent;
  - 45% of survey participants freely assess the reliability of information using certain criteria - the level of a professional researcher.
3. "Are you able to communicate professionally using various means of communication?":
  - 22% of experiment participants, using basic functions, can communicate with other users using Skype or chat basic student level;
  - 35% of experiment participants, using advanced functions, can communicate with other users by using file sharing and Skype independent respondent level;
  - 65% of survey participants use a wide range of communication tools for online communication professional user level.
4. "Are you able to create multimedia content in various formats in the information and digital educational environment of an educational institution?":

- 63% of students create simple digital content basic level;
  - 31% of students use complex digital content in various formats - independent level;
  - 6% of students in various formats can produce complex multimedia content using programming -professional level.
5. "Do you do programming?":
- 75% of survey participants can change simple functions in the software - basic level;
  - 20% of participants know one programming language - independent level;
  - 5% of participants can create databases, use several programming languages - professional level.
6. "Can you solve problems using digital technologies?":
- 55% of students are able to solve a technical problem when using a new program - basic level;
  - 40% of respondents can solve almost all problems using digital technologies - independent level;
  - 5% of students solve all problems when using digital technologies - professional level.
7. "Do you constantly update your skills in using digital technologies?":
- 36% of students understand the need for regular updating of skills - basic level;
  - 40% of respondents use digital technology skills - independent level;
  - 24% of respondents systematically work in the field of digital technologies to improve their professional level -professional level.

The purpose of the survey was to reveal the attitude of those seeking education to the use of the information and digital educational environment of the educational institution, the ability of the respondents to create multimedia content in various formats, to reveal the opinion about the most effective digital tools, to increase the level of digital competence of future specialists, to develop the ability to solve problems when using digital technologies, which arise, etc.

The general dynamics of increasing the level of digital competence of future specialists is not intensive enough, they do not actively create

their own digital resources and use the information and digital educational environment of the educational institution, and they do not use a wide enough range of ICT, they do not have the skills to protect personal information and devices, in most activities remain passive about the safe use of digital resources.

The respondents who answered the questions of the online survey noted that the attitude of the education seekers to the use of the information and digital educational environment of the educational institution, the ability of the respondents to create multimedia content in various formats, to express their opinion about the most effective digital tools, to increase the level of digital competence of future specialists, to form the ability to use digital technologies to solve problems that arise, etc. is not effective enough. Respondents attribute the following to the main problems: weak provision of high-speed Internet connection, inadequate access by educational institutions to digital devices, and inadequate management of access to IT infrastructure.

The use of the information and digital educational environment in the educational process of preserving personnel potential, continuous improvement of professional skills; equalizes the conditions for everyone, ensuring equal access to educational materials due to the systematic use of the information and digital educational environment for the formation of information competence of future specialists in universities.

It should be noted that the creation and implementation of an information and digital educational environment in the practice of higher educational institutions is accompanied by various aspects:

- creation of a single information space of the educational institution as a system with full computerization of all educational units, libraries and their connection to all-Ukrainian and international networks;
- development of automated integrated management systems for structural subdivisions of a higher educational institution: educational department, dean's office, department;
- development of an integrated system of electronic educational and methodological complexes, which would cover all educational disciplines of each faculty and institute of a higher educational institution;

- development of effective methods of using the educational information environment.

Solving these tasks requires, first of all, sufficient material and technical support and financing. In addition, the solution of these problems is significantly hindered by the lack of a systematic, centralized approach to the creation and formation of an educational information environment in higher educational institutions and the insufficient readiness of the teaching staff to use it in their professional teaching activities.

**Barriers to implementation:** Despite potential benefits, effective implementation of digital educational environments is hampered by challenges such as limited access to high-speed Internet, lack of digital devices in educational institutions, and inadequate management of IT infrastructure.

**Recommendations for the future:** To fully exploit the potential of digital educational environments, it is recommended to invest in technological infrastructure, develop teacher training strategies in digital skills, and promote the creation of high-quality and relevant digital educational content.

## Conclusions

The information and digital educational environment of the educational institution is characterized and its necessity in the global space is shown.

Ways of using information technologies in education and their didactic possibilities are revealed, and key characteristics are listed. The purpose and tasks of the information and digital educational environment of educational institutions of modern society are specified.

The process of building an information and digital educational environment of an educational institution is shown. The most important software of the information system of professional training, which should be in the information and digital educational environment of the educational institution, is highlighted.

The necessary conditions and organizational principles of creating an effective information and digital educational environment of an educational institution are substantiated. The main goals and recommended tasks regarding the formation of the information and digital

educational environment in the educational institution are proposed.

An experimental study was conducted to find out the level of digital competence of future specialists and the role of the information and digital educational environment in the educational institution.

During the experimental work, we developed questions for self-assessment by future specialists – students of higher education, aimed at clarifying the level of their digital competence and the role of the information and digital educational environment in the educational institution. Questions were formed based on international approaches, in particular, based on the document "Digital Competence Framework for Citizens: Eight Levels of Mastery with Examples of Use" (DigComp 2.1: Digital Competence Framework for Citizens). The digital competence framework includes such levels: professional user, independent user, and basic user. The Digital Competence Framework includes five areas of this competence: digital literacy and information, digital content creation, collaboration and communication, problem-solving, and safety. The respondents' self-assessment was built on these levels and areas during this study.

The general dynamics of increasing the level of digital competence of future professionals is not intensive enough, they do not actively create their own digital resources and use the information and digital educational environment of the educational institution, and they do not use a wide enough range of ICT, they do not have the skills to protect personal information and devices, in most activities remain passive about the safe use of digital resources.

The respondents who answered the questions of the online survey noted that the attitude of the education seekers to the use of the information and digital educational environment of the educational institution, the ability of the respondents to create multimedia content in various formats, to express their opinion about the most effective digital tools, to increase the level of digital competence of future specialists, to form the ability to use digital technologies to solve problems that arise, etc. is not effective enough. Respondents attribute the following to the main problems: weak provision of high-speed Internet connection, inadequate access by educational

institutions to digital devices, and inadequate management of access to IT infrastructure.

Further research is needed to assess the long-term impact of digital educational environments on students' academic and professional performance, as well as to explore innovative strategies to overcome implementation barriers and ensure equity in access to these tools.

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## Impact of digital educational environment on the emotional intelligence of future primary school teachers: a comparative research

### Вплив цифрового освітнього середовища на емоційний інтелект майбутніх вчителів початкової школи: порівняльне дослідження

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#### Abstract

The aim is comparison parameters and substantiation of the formedness of emotional intelligence of future teachers trained under conditions of a digital educational environment and under conditions of a usual educational format. The development of emotional intelligence and the formation of emotional-intellectual culture make the core of future teachers' language behavior. Statistically significant differences of the respondents trained under conditions of a digital educational environment (Group 1) and those trained under conditions of a usual educational format (Group 2)

#### Анотація

Метою є порівняння параметрів і обґрунтування сформованості емоційного інтелекту майбутніх вчителів підготовлених в умовах цифрового освітнього середовища та в умовах звичайного формату роботи. Розвиток емоційного інтелекту, сформованість емоційно-інтелектуальної культури складають стрижень мовної поведінки майбутнього вчителя. З'ясовано статистично достовірні відмінності респондентів підготовлених в умовах цифрового освітнього середовища (Group 1) і підготовлених в умовах звичайного формату (Group 2) за параметром "розуміння

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were found by the parameter “an individual’s understanding others’ emotions”. The direct involvement of future teachers in the professional process activates positive changes in the formation of emotional intelligence, promotes initial adaptation and professionalization in the workplace. It was noted that a solid theoretical basis of respondents is important for the formation of emotional intelligence. The established scientific facts were recommended for implementation in organization of educational process of future teachers.

**Keywords:** educational process, distance education format, mixed education format, digital educational technologies, professional training for teachers, university, innovatics.

### Introduction

Education is a major facilitator of achieving goals of sustainable development, determined by the United Nations Organization (UNO). Therefore, education should solve a number of global problems of humanity, such as the fight against poverty, maintenance of health and well-being, reduction in inequality, implementation of innovations, etc (Buerkle et al., 2023). Continuous transformational changes, occurring in our society, have affected all areas of human life (Arbeláez-Campillo et al., 2020). Over the past decade, training for future professionals has undergone considerable content innovations and changes. The outlined changes have also impacted a socioeconomic area on the whole and training for teachers, in particular. Conditions of a digital educational environment require organizers and consumers of educational services to have a sufficient level of the development of media-literacy, competences in using information-communicative and digital technologies in an educational environment, knowledge of digital education, information security and cybersecurity.

**Hypothesis.** Parameters of emotional intelligence under conditions of a digital educational environment and under conditions of a usual educational format will have statistically significant differences; correlations of emotional intelligence with the directions of educational-professional activity – theoretical, practical and innovative – will have a different structure of significant correlations.

**The aim.** To empirically study, compare and substantiate the formedness of emotional intelligence of future teachers trained under conditions of a digital educational environment

особистістю емоцій інших”. Безпосередня включеність майбутніх вчителів у виробничий процес активізує позитивні зміни у формуванні емоційного інтелекту, сприяє первинній адаптації і професіоналізації на робочих місцях. Зазначено, що для формування емоційного інтелекту має важливе значення міцна теоретична база респондентів. Рекомендовано з’ясовані наукові факти впровадити у організацію освітнього процесу майбутніх вчителів.

**Ключові слова:** освітній процес, дистанційна форма навчання, змішана форма навчання, цифрові освітні технології, професійна підготовка вчителів, університет, інноватика.

and under conditions of a usual educational format.

### Literature Review

*Emotional intelligence in the space “teacher – student”: the current realities and challenges.* It was substantiated that an educational environment should comply with the requirements for safe conditions and consider, if necessary, the specificity of inclusive education (Popovych et al, 2021b). A variety of educational platforms, applications for distance communication and learning, and the development of artificial intelligence technologies have entered the space “teacher – student” and even taken a number of assessment, signal, control, reproduction and accounting functions. It is not correct to state that artificial intelligence has become a full-fledged subject of organization of educational process, but, at least, it performs its important functions. L. Mialkovska et al. (2023) think that artificial intelligence technologies have dramatically changed content and operational components of students’ communication. All these innovations are very important for social development. At the same time, an important question arises: “Is training for future primary school teachers losing in the formation of the key competences realized under conditions of a digital educational environment?” One of such key competences is emotional intelligence. The Concept of a New Ukrainian School considers emotional intelligence to be a key competence which is crucial for the formation and development of an individual (Bibik, 2017). The researcher thinks that the formedness of a teacher’s emotional-intellectual culture is an indispensable part of a

pedagogue's language behavior. Such a combination finds its reflection in their individual style of activity and is oriented towards activation of learners' cognitive activity (Bibik, 2017).

***The role of emotional intelligence in the formation of the key competences of future teachers.*** The author of fundamental studies about emotional intelligence Daniel Goleman (1995) noted that emotional skills are the basis of emotional intelligence. The scientist considered emotional skills to be, on the one hand, awareness and identification of emotions and, on the other hand, focused attention on regulation and management of emotions. Since emotional skills can be oriented towards one's own and others' emotions, emotional intelligence combines self-realization, awareness of social interactions, self-management and management of relations (Goleman, 1995). The empirical research on a correlation between emotional intelligence and adaptation found that a number of psychological content parameters of emotional intelligence positively correlates with future professionals' adaptation to a professional environment (Halian et al., 2020). In her method for studying emotional intelligence, the researcher V. Zarytska (2019) empirically established and substantiated the following structure of the investigated phenomenon: an individual's understanding their own emotions; self-control and self-regulation of emotions; an individual's understanding others' emotions; ability to use emotions in activity and communication. Examining competences which a future teacher should have, a number of researchers (Aldrup et al., 2023; Halian, 2019; Pavlyk & Radzimovska, 2023; Yaremchuk, 2022) highlight the ability to build partnership with all participants of educational process, emotional balance, empathy and, at the same time, stress-resistance, tolerance of uncertainty and sociability. Such a list of professional qualities also includes sufficiently developed emotional intelligence. Tolerance of uncertainty is a key characteristic affecting permanence of professional development of future teachers (Budnyk et al., 2022). Tolerance in interpersonal relationships as an important component of the formation of emotional culture of future teachers is emphasized by O. Tsiuniak (2023). The researcher underscores that a teacher's psycho-emotional state affects efficiency of organization of learning in a digital educational environment. A teacher demonstrates their emotional culture in interpersonal relationships, in a language etiquette and communicative competences. It is important that a teacher can demonstrate their

support for students, first of all, through their emotional resistance and calmness, which are the indicators of high emotional culture and emotional intelligence (Tsiuniak, 2021). We can generalize that emotional culture and emotional intelligence are interrelated and complement each other. Emotional culture is a basic component, while emotional intelligence is a component having a high operational capacity in professional or everyday activities. Besides, D. Goleman (1995) also associated emotional culture with emotional intelligence. In a number of studies on dominant mental states (Chen et al., 2012; Porras Carmona et al., 2020; Wang et al., 2022), an emotional component has statistically significant correlations with dependent variables in educational-professional activity. Studying psycho-linguistic mechanisms of regulation of educational activity, O. Chebykin (2023) revealed the essence and substantiated the interaction of thinking-speaking acts and motivational-emotional manifestations. The author operationalized the role of an emotional component in educational activity of students. The empirical studies finding significant parameters of an emotional component in such opposite characteristics as assertiveness and self-esteem, optimism evoke scientific interest (Gavín-Chocano et al., 2024). Attention is paid to a temporal component of training for future professionals. It concerns not only the forward-looking nature of training for professionals and their gaining general and special competences, but also an anticipatory ability of students in their future profession (Galanakis et al., 2021; Halian et al., 2021). The research on operationalization of temporality of future professionals in dimensions of psychological well-being demonstrated a key role of positive relationships and psycho-emotional climate (Semenov et al., 2021). It was proved that social support and adequate working loads contribute to teachers' psychological well-being (Carranza Esteban et al., 2023). It was found that social expectations of participants of interaction as a prognostic component of activity are dispositional readiness for constructive interaction which is also maintained by well-developed emotional intelligence (Popovych et al., 2021a; 2021b; 2022).

We can generalize that retrospective analysis adds topicality to the research on the scientific problem of emotional intelligence which develops under conditions of a digital educational environment in the subjects of this process.

Summarizing the problem of emotional intelligence in training future primary school teachers, we should not that this research lies in the plane of the formation of emotional-intellectual culture of teachers. The analyzed studies do not provide exhaustive information about the unambiguous impact of a digital educational environment. The study reveals the aspects of emotional intelligence in the space “teacher – student”, and analyzes the present realities and challenges. The role of emotional intelligence in the formation of the key competences of future teachers is clarified. The outlined articulation of the researched problems makes it necessary to establish statistically significant measurements and differences in training future teachers in digital and traditional environments.

## Methods

**Organization of research.** The empirical research was carried of the academic year 2023–2024. The respondents were informed in advance about confidentiality of the research, its purpose and procedure. Everyone who participated in the research did it voluntarily and gave sincere responses on their own initiative. The Ethical Committees of universities-organizers approved the research and gave the researchers the data on the respondents’ academic performance. Theoretical analysis, empirical data processing, comparison and establishment of significant correlations and differences and design were organized in January, 2024.

**Research Limitation.** A low probability of organizing an ideal experiment in which the respondents of the investigated groups will be fully isolated from a side effect of the factors is a key limitation of our research. The advantage of the research was the fact that Group 1, consisting of the future teachers, trained under conditions of a digital educational environment, really took university courses only in a distance educational format and used the means of a digital educational environment. We found it complicated to organize the sample of Group 2 consisting of the respondents trained under conditions of a usual educational format, since they could also use educational platforms for informal/formal education or their self-development, and it was very difficult to keep track of it. Therefore, our research can reasonably be regarded as a study with characteristics of a quasi-experiment, i. e. a researcher cannot always control a dependent variable, accepting an insignificant impact of additional factors. The retrospective analysis

showed that the problem of emotional intelligence is not new, however, similar empirical studies or research with elements of comparison have not been found. Similar empirical studies would allow confirming or disproving the established scientific facts.

**Participants.** Students seeking a degree in the field of primary education were selected randomly. They comprised the research sample. The sample appropriately reflected the population. For meeting the requirements of accuracy of the experiment, the sample of the experiment involved the postgraduates seeking a Master’s degree in the field of study 013 “Primary education”. Group 1 involved a Master’s degree seekers – future teachers trained under conditions of a digital educational environment of Kherson State University (relocated in Ivano-Frankivsk, Ukraine); Group 2 involved a Master’s degree seekers – future teachers trained under conditions of a usual educational format from Ivan Franko National University of Lviv (Lviv, Ukraine) and Lesya Ukrainka Volyn National University (Luts, Ukraine). The age of the research participants ranged from 22 to 29 years ( $M=24.34$ ;  $SD=\pm 3.01$ ;  $Me=24.50$ ;  $Mo=22.00$ ). Group 1 numbered  $n=35$ ; 35.00% and Group 2 –  $n=65$ ; 65.00%. Distribution of the research participants by gender was as follows: females ( $n=94$ ; 94.00%) and males ( $n=6$ ; 6.00%).

**Procedures and instruments.** The basic psychodiagnostic instrument was the method for determining the level of development of emotional intelligence of the personality (DEIP) (Zarytska, 2019). The method contains seventy-six statements and a four-point Stapel scale with the distribution of points from four to one, where 4 – almost always; 3 – often; 2 – sometimes; 1 – never. Four basic scales and one integral scale were used. The basic scales: an individual’s understanding their own emotions (IUOE); self-control and self-regulation of emotions (SSE); an individual’s understanding other people’s emotions (IUOPE); ability to use emotions (AUE). The integral scale is a general level of emotional intelligence (GLEI). The internal consistency of Cronbach’s alpha by the method equaled .723, that is considered to be a satisfactory level for empirical studies. The questionnaire “Professional readiness of students for innovative activity” (PRSIA) (Tsiuniak, 2021) allowed establishing an innovative component of academic performance. Since the method has two dimensions – a quantitative coefficient and a qualitative coefficient, the integrated coefficient of innovatics (ICI) was

used. The integrated coefficient of innovatics is a combination of points obtained for the respondents' answers to the test questions and data of content-analysis. Combination of quantitative and qualitative dimensions ensured collection of reliable data on the formedness of an innovative component of academic performance of future teachers. The internal consistency of Cronbach's alpha was registered at the level .814, that corresponds to a medium level. The parameters of efficiency of theoretical and practical components comprised the results of academic performance, namely, the grade point average of theory (GPA<sub>th</sub>) and the grade point average of practice (GPA<sub>p</sub>) found by European Credit Transfer and Accumulation System (ECTS).

**Statistical analysis.** The initial processing of the empirical data was carried out by MS "Excel". The computer program SPSS Statistics version 19.0.1 was used to find descriptive frequency characteristics, significant correlations and statistically significant differences. The figure was drawn using the graphical editor MS "Word". Spearman's correlation coefficient

( $r_s$ ), the Mann-Whitney's coefficient (U) and Student's coefficient (t) ensured statistical significance of the measurements. The levels of statistical significance  $p \leq .050$  and  $p \leq .010$  were used for substantiating the research findings. They comprised provability of the empirical regularities.

## Results

To meet the requirements of replication of empirical research, we presented the collected data as descriptive frequency characteristics. Given the strategy of summative research with elements of comparison, we selected three key dimensions: the median (*Me*); the mean (*M*) and the mean squared deviation (*SD*). Characteristics were identified by each investigated group. Comparison was performed by the median, using the Mann-Whitney U-test. All the parameters obtained by the methods "DEIP" (Zarytska, 2019) and "PRSIA" (Tsiuniak, 2021), and also the grade point average of academic performance by theoretical and practical components were used for comparison. Tabl. 1 gives comparison of the investigated parameters.

**Table 1.**  
*Comparison of the investigated parameters by the Mann-Whitney U-test (n = 100)*

Group	Descriptive characteristic	Parameters							
		IUOE	SSE	IUOP E	AUE	GLEI	ICI	GPA <sub>th</sub>	GPA <sub>p</sub>
Group 1 (n=35)	M	46.12	42.08	43.03	39.81	189.55	.64	74.35	70.12
	SD	±9.87	±7.45	±8.13	±6.97	±30.82	±.19	±13.12	±11.92
	Me	46.00	42.00	43.00	40.00	190.00	.63	74.50	71.00
Group 2 (n=65)	M	51.46	44.34	49.37	42.14	201.98	.61	78.12	76.88
	SD	±10.24	±7.89	±10.24	±7.69	±35.51	±.18	±14.02	±14.31
	Me	51.50	44.50	49.50	42.00	202.00	.61	78.00	77.50
Mann-Whitney (U)	U	704.00	768.00	<b>318.00</b>	845.00	731.00	623.50	698.00	623.00
	p	.192	.312	.004	.621	.198	.068	.123	.067

**Source:** Own research.

**Note:** Group 1 – the sample of future teachers trained under conditions of a digital educational environment; Group 2 – the sample of future trained under conditions of a usual educational format; M – the mean; SD – the mean squared deviation; Me – the mediana; U – the value of the Mann-Whitney U-test; p – the level of significance; IUOE – an individual's understanding their own emotions; SSE – self-control and self-regulation of emotions; IUOPE – an individual's understanding others people's emotions; AUE – ability to use emotions; GLEI – a general level of emotional intelligence; ICI – integral coefficient of innovatics; GPA<sub>th</sub> – the grade point average of academic performance in theory; GPA<sub>p</sub> – the grade point average of academic performance in practice.

Training for future teachers under conditions of a digital educational environment (Group 1) is not inferior to Group 2 by a considerable number of the investigated parameters. The only statistically significant difference was registered in the parameter "an individual's understanding others people's emotions" (U=318.00; p=.004). There were increasing and decreasing tendencies

by the rest of the parameters. An increasing tendency in Group 1 was found in ICI (U=623.50; p=.068), the rest of the parameters have an increasing tendency in Group 2.

According to the research plan, we established correlations between the parameters of academic performance and emotional intelligence by

Spearman’s coefficient ( $r_s$ ). Since the sample had uneven distribution, Spearman’s correlation

coefficient ( $r_s$ ) was used. Tabl. 2 gives a correlation matrix of the sample ( $n = 100$ ).

**Table 2.**  
Correlation matrix of the sample ( $n = 100$ )

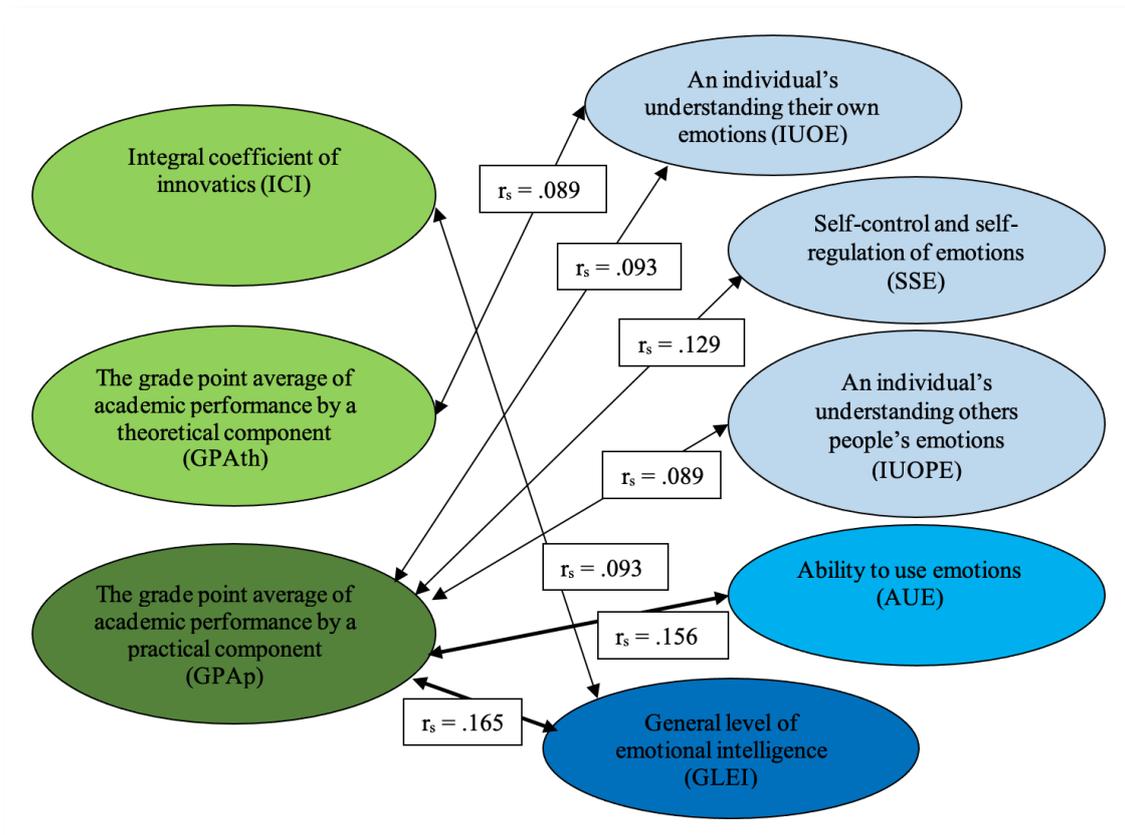
Parameters of academic performance	Spearman’s coefficient	Parameters				
		IUOE	SSE	IUOPE	AUE	GLEI
ICI	$r_s$	.069	.081	-.035	.086	.093*
	p	.262	.067	.696	.056	.042
GPAth	$r_s$	.089*	.032	.079	-.034	.085
	p	.046	.655	.073	.697	.057
GPAp	$r_s$	.093*	.129*	.089*	<b>.156**</b>	<b>.165**</b>
	p	.042	.036	.046	.007	.006

Source: Own research.

Note: ICI – integral coefficient of innovatics; GPAth – the grade point average of theory; GPAp – the grade point average of practice;  $r_s$  – Spearman’s correlation coefficient; p – nominal value; IUOE – an individual’s understanding their own emotions; SSE – self-control and self-regulation of emotions; IUOPE – an individual’s understanding others people’s emotions; AUE – ability to use emotions; GLEI – general level of emotional intelligence; \* –  $p \leq .050$  (given in *italics*); \*\* –  $p \leq .010$  (given in **bold**).

The correlation pleiad complements the correlation matrix. The correlation pleiad allowed visualizing the correlation regularities.

Fig. 1 depicts the correlation pleiad of the parameters of academic performance and emotional intelligence.



**Figure 1.** Correlation pleiad of the parameters of academic performance and emotional intelligence ( $n = 100$ )

Source: Own research.

Note: — positive correlations with  $p \leq .050$ ; - - - positive correlations with  $p \leq .010$ .

We established seven statistically significant correlations of the parameters of academic performance and emotional intelligence. The grade point average of academic performance in practice (GPap) has statistically significant correlations with all the parameters of emotional intelligence that is considered to be a partly unexpected result. There was one significant correlation in ICI and GPAth. We established the strongest correlation of GPap with a general level of emotional intelligence ( $r_s = .165$ ;  $p = .006$ ) and ability to use emotions in communication and activity ( $r_s = .156$ ;  $p = .007$ ). In the research there were no negative statistically significant correlations. We emphasize that the grade point average of practice (GPap) is the most important dimension of academic performance in the context of the

formation of emotional intelligence. The significant correlation with AUE ( $r_s = .156$ ;  $p = .007$ ) also testifies to it.

According to the plan of the empirical research, comparison of the investigated groups by low and high parameters of academic performance was performed. As a result, we found statistically significant differences in Groups A and B (low and high levels of ICI), in Groups C and D (low and high levels of GPAth) and in Groups E and F (low and high levels of GPap). All the investigated groups were distributed by the median (Me). Tabl. 3 gives the results of comparison of the investigated parameters in Groups A ( $n = 32$ ; 32.00%) and B ( $n = 68$ ; 69.00%) by the Mann-Whitney U-test.

**Table 3.**  
*Comparison of the investigated parameters in Groups A and B distributed by ICI*

Mann-Whitney (U)	Parameters				
	IUOE	SSE	IUOPE	AUE	GLEI
U	577.50	429.00	639.00	477.00	<b>403.00</b>
p	.112	.013	.365	.029	.009

Source: Own research.

Note: U – the Mann-Whitney test; p – the level of significance; IUOE – an individual’s understanding their own emotions; SSE – self-control and self-regulation of emotions; IUOPE – an individual’s understanding other people’s emotions; AUE – ability to use emotions; GLEI – a general level of emotional intelligence; \* – the level of significance  $p \leq .050$  (given in *italics*); \*\* – the level of significance  $p \leq .010$  (given in **bold**).

It was found that the group with a high level (Group B) of the integral coefficient of innovatics (ICI) has an advantage over Group A by SSE ( $U = 429.00$ ;  $p = .013$ ), AUE ( $U = 477.00$ ;  $p = .029$ ), GLEI ( $U = 403.00$ ;  $p = .009$ ). Group A does not have an advantage by any of the parameters.

Tabl. 4 gives the results of comparison of the investigated parameters in Groups C ( $n = 41$ ; 41.00%) and D ( $n = 59$ ; 59.00%) by the Mann-Whitney U-test.

**Table 4.**  
*Comparison of the investigated parameters in Groups C and D distributed by GPAth*

Mann-Whitney (U)	Parameters				
	IUOE	SSE	IUOPE	AUE	GLEI
U	417.00	587.00	431.50	511.50	<b>392.00</b>
p	.011	.279	.015	.063	.008

Source: Own research.

Note: U – the Mann-Whitney test; p – the level of significance; IUOE – an individual’s understanding their own emotions; SSE – self-control and self-regulation of emotions; IUOPE – an individual’s understanding other people’s emotions; AUE – ability to use emotions; GLEI – a general level of emotional intelligence; \* – the level of significance  $p \leq .050$  (given in *italics*); \*\* – the level of significance  $p \leq .010$  (given in **bold**).

It was found that the group with a high level (Group D) of the grade point average of academic performance by a theoretical component (GPAth) has an advantage over Group C by IUOE ( $U = 417.00$ ;  $p = .011$ ), IUOPE ( $U = 431.50$ ;  $p = .015$ ), GLEI ( $U = 392.00$ ;

$p = .008$ ). Group C does not have an advantage by any of the parameters.

Tabl. 5 gives the results of comparison of the investigated parameters in Groups E ( $n = 29$ ; 29.00%) and F ( $n = 71$ ; 71.00%) by the Mann-Whitney U-test.

**Table 5.**

Results of comparison of the investigated parameters in Groups E and F distributed by GPAP

Mann-Whitney (U)	Parameters				
	IUOE	SSE	IUOPE	AUE	GLEI
U	475.00	<b>288.00</b>	498.00	<b>328.00</b>	<b>321.00</b>
p	.028	.000	.036	.000	.000

**Source:** Own research.

**Note:** U – the Mann-Whitney test; p – the level of significance; IUOE – an individual’s understanding their own emotions; SSE – self-control and self-regulation of emotions; IUOPE – an individual’s understanding other people’s emotions; AUE – ability to use emotions; GLEI – a general level of emotional intelligence; \* – the level of significance  $p \leq .050$  (given in *italics*); \*\* – the level of significance  $p \leq .010$  (given in **bold**).

It was found that the group with a high level (Group F) of the grade point average of academic performance by a practical component (GPAP) has an advantage over Group E by all the parameters of emotional intelligence: IUOE (U = 475.00;  $p = .028$ ), SSE (U = 288.00;  $p = .000$ ), IUOPE (U = 328.00;  $p = .000$ ), AUE (U = 328.00;  $p = .000$ ), GLEI (U = 321.00;  $p = .000$ ). The highest parameters of a statistically significant advantage were registered in the parameters: SSE (U = 288.00;  $p = .000$ ), AUE (U = 328.00;  $p = .000$ ), GLEI (U = 321.00;  $p = .000$ ) which have rather an operational direction that a formal one.

## Discussions

The issue of emotional intelligence in professional development of future professionals is not new, it has been sufficiently investigated by researchers in different social areas. At the same time, there are innovative empirical studies (Chebykin, 2023; Kolly-Shamne & Tokareva, 2021), showing that a scientific community’s interest in the problem of emotional intelligence has not been decreasing. Researchers consider applied empirical studies to be especially valuable, since they can contribute to solving urgent problems, and it will be possible to immediately implement their results in educational process (Jabbarov et al., 2023; Mamani-Benito et al., 2023; Popovych et al., 2022; Rojas Samanez et al., 2019). Rapid changes in society require advanced solutions with a well-developed algorithm of implementation.

Comparison of descriptive frequency characteristics of the two groups (see Tabl. 1) demonstrated a lack of significant differences by a considerable number of parameters (seven dimensions). The only statistically significant difference was registered in the parameter “an individual’s understanding other people’s emotions” (U=318.00;  $p=.004$ ). We can explain this advantage of the respondents trained under

conditions of a usual educational format by the fact that regular offline communication with lecturers, students and university administrations contributes to becoming acquainted with other people and, consequently, knowing themselves, gaining experience and understanding other people’s emotions through psychological mechanisms of interiorization and exteriorization. However, we should note that there were no significant differences in the parameter “an individual’s understanding their own emotions” (U = 704.00;  $p = .192$ ) (see Tabl. 1). Obviously, the formedness of this parameter possesses sufficiently high assimilative capacity, in comparison with the previous one, therefore there were no significant changes. We can generalize that immediate emotional communication of future teachers affects the formation of their emotional intelligence. Since they will have to work with pupils, the formedness of emotional intelligence and a number of characteristics depending on the level of emotional intelligence will affect a qualitative component of organization of educational process. A similar study shows a correlation between an applied component and a professional identity of future professionals (Kovalchuk et al., 2022; Kuk et al., 2015; Sanabrias-Moreno et al., 2023), that does not contradict our empirical findings and explanations.

The correlation matrix (see Tabl. 2) and pleiad (see Fig. 1) added a number of significant arguments concerning regularities of a correlation between the parameters of academic performance and emotional intelligence. A dominant number of statistically significant correlation between the grade point average of academic performance by a practical component (GPAP) and the parameters of emotional intelligence makes it the most important and the most dependent variable in the formation of emotional intelligence. It is worth noting that this component was determined by the respondents’ results of academic performance, professional

training and pre-graduation practice. It is obvious that immediate involvement in a future professional process activates positive changes in the formation of emotional intelligence of future teachers. We should underscore that a lack of advantage of the respondents trained under conditions of a digital educational environment considerably loses in the formedness of emotional intelligence because of deficiency of immediate emotional communication. The empirical findings obtained in other studies (Hen, & Sharabi-Nov, 2014; Molero Jurado et al., 2022) partly confirm the fact established in our research.

Comparison by all the parameters of academic performance (see Tabl. 3–5) allowed efficiently identifying statistically significant differences in the parameters of emotional intelligence. The advantage of Group F (see Tabl. 5) by all the dimensions of emotional intelligence testifies to the validity of our previous conclusions and the importance of a practical component in training for future teachers. The advantage of Group B (see Tabl. 3) based on the parameters “self-control and self-regulation of emotions”, “ability to use emotions” and “a general level of emotional intelligence” shows that the operational parameters of emotional intelligence, related to self-control, self-regulation and using emotions in communication and activity, have an impact on an innovative component in professional training. We assume that this comparison also reveals a key role of a practical component, but this assumption requires confirmation. The advantage of Group D (see Tabl. 4) by the parameters “an individual’s understanding their own emotions”, “an individual’s understanding other people’s emotions” and “a general level of emotional intelligence” emphasized a key role of cognitive intentions in the formation of emotional intelligence. It testifies that it is impossible to form emotional intelligence without a solid theoretical foundation.

The aim was achieved and the hypothesis was confirmed. We found a number of significant differences, underscored the importance of a practical component in the formation of emotional intelligence, demonstrated a different structure of significant correlations of theoretical, practical and innovative components of academic performance. The obtained empirical results do not cover the entire research subject and require further steps towards operationalization and implementation in educational process. The research prospects consist in searching for methods and techniques

for efficient formation of emotional intelligence of future professionals under conditions of a digital educational environment.

The given results do not exhaust the depth and complexity of the research into emotional intelligence in training future teachers. The prospects of further research will consist in creating a comprehensive training program for the development of emotional intelligence, testing and documentation of the research results.

## Conclusions

The parameters of emotional intelligence of future teachers trained under conditions of a digital educational environment were studied, and comparison of dependent and independent variables was performed. We registered the only statistically significant advantage of the parameter “an individual’s understanding other people’s emotions” ( $U=318.00$ ;  $p=.004$ ) characteristic of the respondents trained under conditions of a usual educational format. Seven statistically significant correlations of the parameters of academic performance with emotional intelligence were established. A dominant advantage of the grade point average of academic performance by a practical component (GPAp) with the parameters of emotional intelligence was identified. It was substantiated that it is the most important and the most dependent parameter in the formation of the respondents’ emotional intelligence. It was explained that the respondents’ immediate involvement in a future professional process activates positive changes in the formation of emotional intelligence of future teachers. It was proved that a solid theoretical foundation of respondents is also very important for the formation of emotional intelligence.

The obtained empirical results possess scientific novelty, and they are recommended for implementation in educational process.

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## Paradigmatic dimensions of local public management research: The path to reliable managerial decisions

### ПАРАДИГМАТИЧНІ ВИМІРИ ДОСЛІДЖЕНЬ МІСЦЕВОГО ПУБЛІЧНОГО УПРАВЛІННЯ: ШЛЯХ ДО НАДІЙНИХ УПРАВЛІНСЬКИХ РІШЕНЬ

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#### Abstract

Explicated the need to compare the established paradigmatic ideas in local public management and in the political science research environment. Particular attention is paid to the important issue of the project relationship establishing between the paradigmatic approach and the subject field of public management research. Essential discrepancies between the key paradigmatic approaches to local public management and policy making at the local level are revealed. Stated the necessity of essential empirical material evaluation for further research and possibly improvement of the regulatory framework for local public management. Proved that the particular author's (actors') main reason for conducting paradigmatic discussions on local public management is the need to communicate with a powerful research tradition. It is concluded that, the success of public policies and their impact on the lives of citizens depends on an understanding of

#### Анотація

Висвітлено необхідність порівняння встановлених парадигматичних ідей у місцевому державному управлінні та у середовищі політичних досліджень. Особлива увага приділяється важливому питанню встановлення проектних відносин між парадигматичним підходом та предметною областю досліджень у сфері державного управління. Виявлено суттєві розбіжності між ключовими парадигматичними підходами до місцевого державного управління та формування політики на місцевому рівні. Зазначено необхідність оцінки суттєвого емпіричного матеріалу для подальших досліджень та можливого вдосконалення нормативної бази для місцевого державного управління. Доведено, що головною причиною проведення парадигматичних дискусій щодо місцевого державного управління конкретним автором (акторами) є необхідність комунікації з

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epistemic foundations. Established that different paradigmatic alternatives of public decisions are determined on the basis of scientific data. Considered the most optimal way of applying any paradigmatic approaches is the analysis of the expediency of applying the methodology and forecasting the achievement of scientific novelty or specific results of management projects.

**Keywords:** paradigmatic foundations, decision-making, local public management, local politics, epistemic freedom.

## Introduction

In contemporary Ukraine and all over the world obtained the significant number of scientific schools of public management researches. They generally adhere to the principles of “multiparadigmaticity”: the validity and effectiveness of all scientific paradigms. However, the political and public administration sciences of Ukraine faces the task of unifying the meaning of paradigms of local public management research. This is necessary, firstly, in order to finally remove the influence of unreal (irrational, ideologically determined) methodological and theoretical ideas. Secondly, it is necessary to intensify research on consolidated democracy in Ukraine and other transitive countries and political aspects of sustainable development. For this, it is obvious that there is a need to compare the established paradigmatic ideas in Ukraine and in the leading countries of the political and public administration interdisciplinary science environment.

The paradigmatic approaches have a broader meaning than the theoretical foundations of research. It covers the author's research problem subjective choice, his or her values and author's world view guidelines. Also it embraces the possibilities of research results predicting and planning (even before it begins). An important issue of the project is relationship establishing between the paradigmatic approach and the subject field of public management research. It is also expedient to find out the key foundations of paradigmatic approach defining for different scientific schools.

The orientation of paradigmatic approaches of local public management research to a certain methodology becomes fundamentally important. This should provide a more accurate prediction

потужною дослідницькою традицією. Зроблено висновок, що успіх державної політики та її вплив на життя громадян залежить від розуміння епістемологічних основ. Встановлено, що різні парадигматичні альтернативи державних рішень визначаються на основі наукових даних. Розглянуто найбільш оптимальний спосіб застосування будь-яких парадигматичних підходів як аналіз доцільності застосування методології та прогнозування досягнення наукової новизни або конкретних результатів управлінських проектів.

**Ключові слова:** парадигматичні основи, прийняття рішень, місцеве державне управління, місцева політика, епістемологічна свобода.

of research results. As a result of the research, a more standardized “algorithm” for the local public management research work should be established, which will probably consist of the following: 1) author's own paradigm definition; 2) subject area clarification; 3) optimal methodology identification; 4) selection of adequate methods.

The purpose of the article is to identify differences and collect key benefits in the interpretation and application of paradigmatic principles of local public management researches.

## Literature Review

The problem of paradigmatic prerequisites of political management is of interest to a number of modern authors. For instance, the study of A. Pegan delves into strategic planning methods for local government co-creation, drawing evidence from Croatia and Slovenia. Through empirical analysis, it sheds light on effective strategies for fostering collaboration between governments and citizens in the local context (Pegan, 2023). E. D. Schoburgh critically examines the concept of the «new orthodoxy» in local governance within the Caribbean context, questioning whether it represents a genuine paradigm shift or merely rhetorical discourse. She offers insights into the dynamics of local governance and its evolution in the region (Schoburgh, 2009). N. Baptista, H. Alves, N. Matos synthesize existing research on the engagement of public sector organizations in co-creation activities with citizens. It explores the various benefits, drivers, and barriers associated with such collaborative endeavors, providing a comprehensive overview of the subject (Baptista et al., 2020). (David et al., 2023). employ the

PRISMA methodology to analyze and synthesize existing literature on digital technology adoption strategies by local governments. It offers insights into the factors influencing the adoption of digital technologies and provides recommendations for enhancing technological uptake in local governance (David et al., 2023). K. Gurdon-Nagy (2021) examines whether local governments are drivers or followers of broader societal transformations. She contributes to the understanding of the relationship between local governance and societal change within the Hungarian context. Despite these achievements, there is a need to consider paradigmatic discussions within the framework of the administrative and management components of public management at the local level.

### Methodology of the research

The process of data systematization regarding paradigmatic dimensions in local public management research was carried out on the basis of a comprehensive analysis of the main philosophical and political paradigms and the decision-making agenda of local political management. The systematic approach revealed the regularity and expediency of the application of certain paradigmatic dimensions and prerequisites for clarifying the results of their application both in the framework of research and in the framework of practical managerial activities. The paper analyzes the empirical agenda of political decision-making in contemporary Ukraine during the war in a comparative context with modern sustainable democracies. The modern management community at the local level in the broadest sense (leaders and performers), which carries out certain research procedures within the framework of strategic decision-making at the local level, acted as the main actors, choosing the paradigmatic dimension. The development of projective procedures for the analysis of the managerial paradigms of the context at the local level was carried out on the basis of the application of inductive and hypothetical-deductive methods, as well as prognostic analysis. They made possible to reveal the need for further identification of the choice of a paradigmatic dimension by researchers and managers within the framework of scientific support for decision-making.

### Results and Discussion

The significance of the paradigms evaluation among other things is revealed in the paradigmatic foundations` of political science

research identification. It provides essential empirical material for further research and possibly improvement of the regulatory framework for local public management. In particular, the real features and essential peculiarities of the paradigmatic choice of both postgraduate students and their supervisors will be revealed. This will make possible to raise questions about “decision-making standards” within the framework of local public management and further improve the theoretical and methodological basis. The question of the fundamentals` formation of an integral political theory (Grand Theory) also will be raised.

Collecting data on the content of the paradigmatic dimension of local public management research will allow to more fully realize the topic of scientific and scientific research. There is also an ambitious opportunity for local public management researchers and local governing actors to improve their understanding of the author`s (actor`s) paradigm choice as part of their research.

The obtained conclusions and recommendations regarding the «algorithmization» (algorithm providing) and/or streamlining of the theoretical foundations and methodology of political science/public administration research will be used in local public management modernization. The effectiveness of conclusions and recommendations evaluation will be possible after the research results publication in scientific publications, methodological manuals and monographic studies. The particular author`s (actors`) main reason for conducting paradigmatic discussions on local public management is the need to communicate with a powerful research tradition.

The local public management research paradigm evaluation could be planned as part of a series of interviews with leading local public management actors within the research prospective project. The first step is to clarify the content of paradigmatic approaches and their significance for local public management. Also, in the form of an open question, they will be asked to provide their own definition of the paradigmatic approach in political science research. Also a question regarding research and criteria for determining the optimal methodology based on a paradigmatic approach will be included. It will outline the preferences` of scientists, who are postgraduate students` supervisors. The result of the expert interview will be the identification of the most significant and used paradigmatic approaches in political studies. An idea will also

be formed about the possibility of transition from the paradigmatic level to the methodological level within the contemporary political and public administration sciences' framework.

Epistemic foundations of public policy on local level grounds on the provisions, which are underlying the understanding, analysis and formulation of political decisions in the sphere of local public governing. It is a broad field that encompasses various scientific disciplines, such as political science, sociology, economics, law, and others, which help to understand complex social problems and ways to solve them. This is especially evident against the background of the ontological space in which a list of alternatives for making local policy decisions is formed. As appropriately noted M. Paananena, M. Alasuutarib, K. Karilaa, and A. Siippainen, when utilizing ontological authority, actor presents or frames the nature of the situation as an objective fact for, example, by using research or statistics. The second is moral authority, which draws on generally approved-of and morally binding norms, such as human rights. The third is capacity-based authority, which depends on the perceived ability of an actor to condition the actions of other actors (e.g. by imposing sanctions). The fourth is charisma, which is based on referring to the unique character of an actor, be it a person or an organization. The four forms of epistemic work are mutually intertwined and can – and often do – accumulate meaning. In other words, an actor can utilise more than one aspect of epistemic work to support their argument (Paananena et al., 2019).

One of the key paradigmatic foundations of public policy is political theory, which studies political institutions, processes, and behavior, revealing decision-making mechanisms and interactions between different actors in a political system. Political economy also plays an important role in helping to understand the economic aspects of political decisions and their impact on society. The materials of the debate on the epistemic examination of local politics, worked out M. Paananena, M. Alasuutarib, K. Karilaa, and A. Siippainen make it possible to assert that in discussing these shared aims and norms, moral authority was used to argue for the obligation to think about the 'rights' or 'equality' of the children. Even though equality and children's rights were shared aims among the speakers, references to moral authority were made only by those who opposed the restrictions. Claims in relation to moral authorities, such as references to the constitution and the EU, were made when some speakers argued that savings

could not be the only criterion to influence decision-making. Other norms, such as the rights of children, had to be taken into account (Paananena et al., 2019).

Sociology and psychology disciplinary paradigms are important for analyzing society's behavior and perceptions, and for understanding what factors influence political decision-making. Jurisprudence provides the basis for the development of laws and regulations that underlie public policy. The example of the discussion about the organization of education at the local level shows that interdisciplinary epistemic (paradigmatic) synthesis is important for the development of a consensus and mutually acceptable decision at the local level. As Finnish scholars point out, in the council debates, the first construction considered ECEC (*Early childhood education and care*) as an efficient method of ensuring human capital development – primarily, ECEC fulfils an educational function. ECEC is constructed as being good for child development. However, it is considered a public expense that should be reduced. According to this construction, parents utilise full-time day-care services when they do not need to. Moreover, it was posited that the restriction of unconditional entitlement to full-time day-care services would result in considerable savings while leading to disruptive changes to the practices or lives of the families affected (Paananena et al., 2019).

An interdisciplinary approach to the study of public policy makes it possible to understand the complexity of social problems and find effective solutions to solve them. The success of public policies and their impact on the lives of citizens depends on an understanding of epistemic foundations. Choosing the right political alternatives based on epistemological analysis involves the use of multidisciplinary (for example, economic and legal) scientific data and a mental strategy to understand the essence of the problem and possible solutions. In this regard, the interdisciplinary paradigmatic matrix allows to choose the right solution even under the condition of equal influence of two equal factors of influence on the local situation. M. Ylönen, J. Jaakkola and L. Saari truly resumed, that the 2010s showed a further extension of the epistemic shift from lawyers to economists, which completed the long-term transformation from legalism to economism in the Finnish corporate tax policy. First, the growing reliance on economics in policy-making enabled anchoring policy proposals on economics literature. The normalization of this practice contributed to a situation where the MoF's

leadership was able to bypass their own Tax Department to advance a major corporate tax cut. Second, the normalization of the use of economics enabled designing tax policy with future-oriented estimates that relied on assumptions drawn from the economic theory (Ylönen et al., 2021).

Finding optimal solutions in local public administration is a complex and multifaceted process that requires the analysis of various aspects, taking into account the interests of various parties and the ability to choose the most effective strategies. The paradigmatic (epistemic) compatibility of some academic disciplines allows for the development of a certain algorithm for evaluating events and phenomena at the local level. Thus M. Ylönen, J. Jaakkola and L. Saari rightly claim, that exploiting opportunities between professional bodies of knowledge requires instigating a shift in one of the five factors the extent to which politicians rely on expertise; the balance of power between academic disciplines in evidence-based policy-making; the disciplinary base to which the dominant expert groups rely on; the ways in which the epistemological, ontological and methodological mainstream changes over time within particular disciplines; and the extent to which IOs are seen as epistemic versus policy-driven authorities (Ylönen et al., 2021).

The process of paradigmatic evaluation of the local decision-making situation begins with a thorough analysis of the problem or situation to be solved. This may include collecting and

analyzing data, identifying the factors that influence the problem, and understanding its root causes. On the example of legal and economic paradigmatic considerations, one can see the deployment of management processes in important branches of the local economy. M. Ylönen, J. Jaakkola and L. Saari have noticed, that lawyers had not have made way to economists in key working groups, the introduction of theoretical economic approaches to the forefront of tax policy reasoning would have been extremely unlikely. Ultimately, these mutually reinforcing shifts created a situation where a single economics review article became the main justification for a 4.5-percentage point corporate tax rate cut with huge budgetary impact. Given the heightened reliance on economic reasoning in policy-making, similar path-dependencies are likely to be found in other countries as well (Ylönen et al., 2021).

Thus before looking for appropriate solution in local public management, it is necessary to clearly define the goals to be achieved, as well as the constraints that may affect the decision-making process. After defining the problem and goals, it is necessary to find different options for solutions. This may include consideration of different strategies, programs or policies that may be used to achieve the objectives. Each solution option needs careful evaluation, including an analysis of their advantages, disadvantages, costs, and possible consequences. Evaluation methods may include cost-benefit analysis, SWOT analysis, risk assessment, etc.

**Table 1.**

*Tasks of paradigmatic discussions at the level of local politics*

Type of a paradigm	Task	Actors	Result
Disciplinary/ interdisciplinary	Decision-making in a specific area	Managers, leaders, officials of local administration	Coordination of interests of institutional subjects or links of local administration
Valuable/ socio-cultural	regulation of citizens' behavior	Experts and non-governmental organizations	Stability and consensus in the community
research	search for obtaining new information, provision of innovations	Scientific communities at the local level, local business	Sustainable innovative development of the community

Developed on the base of Federation of Canadian Municipalities VNG International Publication Federation Of Canadian Municipalities. (2015)

Based on the analysis of paradigmatic (epistemic) alternatives, a decision could best meet the set goals and constraints. After making a public management decision, it is necessary to implement it and monitor the results. This allows for expert to detect any negative consequences in

time and adjust strategies if necessary. At the global level, the influence of the epistemic position of the actor who makes the decision, as well as the paradigmatic environment in which the discussion takes place, is already felt. As argued Ch. Bueger and A.Littoz-Monnet, by

epistemic orders, we refer to those larger structural conditions and long-term patterns, whether more ideational or material, that shape knowledge production. Paying attention to epistemic orders provides us with new understandings of how the problems or “objects” of global governance are constructed, delineated and eventually governed (Bueger & Littoz-Monnet, 2023).

Openness, public participation and balanced consideration of different points of paradigmatic view acquire key importance in local public management. It is also important to have scientifically sound data and use best practices to achieve optimal results. A rather unexpected circumstance for the paradigmatic choice of decisions and actions within the framework of local politics is the appearance of various stakeholders of epistemic justification. In particular, it is possible to say about powerful business actors. According to Ch. Bueger and A. Littoz-Monnet, public de-investments in universities and research as well as a growing economic valuation of scientific knowledge have made it possible for large companies and the philanthropies of the global commercial elite to position themselves as knowledge producers. Thus, a large share of research and expertise activities are today funded by companies, consultants, philanthropists, or their offspring organizations (Bueger & Littoz-Monnet, 2023).

The formation of local public management paradigmatic rationale begins with the collection and analysis of scientific data on a problem or situation that requires policy intervention. This may include statistical data, research results, expert opinions, and more. A careful analysis of the data helps to understand the essence of the problem and its impact on society. Different epistemic alternatives of public decisions are

determined on the basis of scientific data. This can be done through SWOT analysis, cost-benefit analysis, risk assessment, and other evaluation methods. Ch. Bueger and A. Littoz-Monnet, focusing on epistemic orderings, reintegrate considerations of how the micro and the macro intersect in processes of knowledge production, shedding light on how micro-moves often sustain, but sometimes disrupt larger structural conditions. Danish authors also emphasize the necessity of examining processes of sense-making and knowledge-making, rather than questions of collaboration and effectiveness. This lens makes it possible to reflect on our understandings of what needs to be governed, opening up the realm of our reflections on global governance, the kinds of problems it should be tackling, and the objectives it is meant to be pursuing (Bueger & Littoz-Monnet, 2023).

The expert opinions` paradigmatic grounds and epistemic considering experience of local governance officers and leaders in relevant fields can be an important source of information for determining the correct (appropriate) policy alternatives. It is important to take into account the specifics of the context in which the political decision will be implemented. This means taking into account cultural, historical, economic, and social factors that may affect the success of an alternative. The choice of a policy alternative should be based on objective arguments, logic and scientific data, not on personal beliefs or ideology. It is important to ensure the transparency of the process of choosing political alternatives and take into account the opinions and interests of the public. Carrying out an epistemological analysis before making a political decision helps to ensure the validity, effectiveness and legitimacy of political actions in response to public problems on a local level.

**Table 2.**  
*The main political and philosophical paradigms and the agenda of local political management decisions*

The title of the paradigm	Epistemic focus or motivation	The field of the decision
Liberal	protection of rights and freedoms	Political stability development of local democracy
Rational-critical	scientific justification	introduction of innovations
Postmodern	variability, unpredictability of development	identification of risks
Communicative	argumentation, ethical justification	openness of the community
Synergistic	interaction of the system and the external environment	strategic development of the local community

Developed on the base of S. Lavelle (2015), J. Bryson, B. Crosby and M. Stone (2015) and M. Cawley (2016)

Based on the above mentioned, the purpose of the conducting of paradigmatic choice could be proposed as the identifying of researchers` and managers (local leader) attitudes to the «algorithmization» (algorithm providing) of methodological search and paradigmatic justification of the theoretical grounds of research and the policy evaluation. It is necessary to establish how contemporary local public management researchers are aware of the relationship between the paradigm of their research, their author's preferences and value guidelines. We can propose the local public management research questionnaire, which can include questions about the paradigmatic sources of their academic school, the content of their paradigmatic worldview and value principles. The question will be especially important, how these elements had influenced their understanding of the methodology and organization of local public management research. The second block of questions will be to find out the intentions and aspirations of local

management actors to achieve results within their subject area and possible subjective motivations. The third block will be a survey of local public management researchers` opinion regarding the application of their proposed paradigms of interdisciplinary science research, as well as open questions regarding their own vision of optimal paradigms.

Within the third phase on the basis of the received information, a joint scientists (experts) and practitioners` seminar-discussion could be held with the aim of establishing conclusions and approving or rejecting the algorithm for identifying the optimal paradigmatic approach, establishing the subject area of research, applying the optimal methodology, and obtaining new scientific results. Thereby research will both qualitative and quantitative. On first two phases it will be qualitative. Then the final phase has to be quantitative since it will be necessary to calculate the answers to the questionnaire questions.



**Scheme 1.** The order of paradigmatic justification of the theoretical grounds of research and (or) the local policy evaluation.

Based on K.Gurdon-Nagy`s paradigmatic changes in Hungary local self-governments analyses (Gurdon-Nagy, 2021)

## Conclusions

Thus, local public management is now in a situation where it is necessary to consider political alternatives both in the context of the competition of political actors at the local level and within the framework of making management decisions. The paradigmatic bases for determining the right direction of local governance include ideological (doctrinal) principles, the engagement of officials, the

penetration of scientific elements of scientific research into governance practices, the presence of value and behavioral determinants of the cognitive processing of local public decisions. The possibility of choosing the «correct» (or appropriate) paradigmatic affiliation within the framework of local public management research or within the framework of applied management activities at the local level depends on the level of training and competence of researchers or

managers. The most optimal way of applying any paradigmatic approaches is the analysis of the expediency of applying the methodology and forecasting the achievement of scientific novelty or specific results of management projects. Accordingly, the possibility of making the «correct» decision in local public management requires broadening of views on the current situation. This, in turn, involves working in a multiparadigmatic mode. The legal or political paradigm of local public management largely depends on the initiative of actors of local management. At the same time, the presence of an impartial and rationally critical analysis of the problems and resources of the local community indicates the introduction of a scientific approach to management on an interdisciplinary basis. Therefore, in the context of further discussions regarding the paradigmatic justification of local public management and in general activities regarding the selection of political alternatives, it is appropriate to turn to the assessment of the potential of artificial intelligence in the context of adopting standard management decisions.

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## Use of electronic search systems in the investigation of corruption crimes in Ukraine: opportunities and challenges for human rights

### Використання електронних пошукових систем під час розслідування корупційних злочинів в інтересах кримінального судочинства: можливості та загрози для прав людини

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#### Abstract

The purpose of the article is to study the use of electronic search systems during the investigation of corruption crimes in the context of the balance of interests of criminal justice and ensuring guarantees of human rights and freedoms. Methodology. In the process of scientific research, the following methods were used: dialectical, logical, dogmatic, monographic, systemic and structural, comparative and legal, sociological, legal modelling. Research results. It was established that in accordance with the developed and tested methods investigators use various information systems when investigating on corruption crimes; the content and features of these schemes were studied. International documents establishing the limits of the possible use of artificial intelligence in criminal proceedings were considered. The decisions of the

#### Анотація

Метою статті є дослідження використання електронних пошукових систем під час розслідування корупційних злочинів в контексті балансу інтересів кримінального судочинства та забезпечення гарантій прав і свобод людини. Методологія. У процесі наукових пошуків були використані наступні методи: діалектичний, логічний, догматичний, монографічний, системно-структурний, порівняльно-правовий, соціологічний, правового моделювання. Результати дослідження. Встановлено, що відповідно до розроблених та апробованих методик, під час розслідування кримінальних проваджень про корупційні злочини слідчі використовують різноманітні інформаційні системи; вивчено зміст і особливості застосування останніх. Розглянуто міжнародні документи, які

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ECTHR on the need for a balanced approach to interference with privacy and delimitation of such interference, were studied. Practical implementation. The ways to achieve a balance of the interests of the parties in the criminal procedural legislation of European countries were investigated in order to implement their positive experience in Ukraine. Value/originality. The principles, on which the process of regulating the use of electronic search systems, databases, algorithms and artificial intelligence in the criminal procedural legislation of Ukraine should be based, are proposed.

**Keywords:** corruption crimes, criminal justice, electronic search systems, ECTHR, human rights.

## Introduction

The use of databases, electronic search systems, special technical means of removing information, application of software complexes and artificial intelligence for their systematization and analysis is becoming more widely used every year. Such means are constantly being improved, and the trend of digitalization of social relations is regularly increasing sources of data for law enforcement and intelligence agencies. In this regard, more and more attention is drawn to the issues related to ensuring the balance of the interests of criminal justice and the rights and freedoms of persons who experience intruding into private life. In the context of the protection of human rights and freedoms, automatic retrieval of information and creation of databases on individuals, regardless of whether they are the objects of investigations, investigative or intelligence activities, is of particular concern.

At the same time, little attention is paid to the issues of preservation, use, destruction of information that cannot be used in the interests of law enforcement, guarantees of non-interference or restrictions on interference in the private sphere, and their legal regulation. Law-making activity, the introduction of mechanisms of supervision and control over the legality of the accumulation and use of digital information, is significantly lagging behind the processes of improvement of technical means, used for this purpose.

встановлюють межі можливого використання штучного інтелекту у кримінальному судочинстві. Вивчено рішення ЄСПЛ, які стосуються необхідності збалансованого підходу до втручання у приватного життя та визначення меж такого втручання. Практичне значення. Було досліджено шляхи досягнення балансу інтересів сторін у кримінальному процесуальному законодавстві країн Європи з метою імплементації позитивного досвіду в Україні.

Цінність/оригінальність. Запропоновано принципи, на яких повинен базуватися процес регламентації використання електронних пошукових систем, баз даних, алгоритмів та штучного інтелекту в кримінальному процесуальному законодавстві України.

**Ключові слова:** корупційні злочини, кримінальне судочинство, електронні пошукові системи, ЄСПЛ, права людини.

Therefore, the aim of our article is to study the use of electronic search systems during the investigation of corruption crimes in the context of the balance of interests of criminal justice and ensuring guarantees of human rights and freedoms.

In view of the organizational problems of pre-trial investigation, in particular the investigation of corruption offenses, which affect its full and prompt implementation, the application of AI is justified and appropriate. In order to properly use modern technologies, as well as avoid the breach of human rights in the course of their application, it is necessary to examine international legal instruments governing this issue, study foreign experience on this matter, clarify how this problem is regulated in Ukrainian legislation and formulate the respective conclusions and recommendations.

## Methodology

The methodological basis for the study is dialectical method of scientific knowledge, on the basis of which the examination of the application of electronic search systems in the investigation of corruption crimes is considered as a multi-stage, complex and contradictory process requiring proper regulation. Other methods used in the article are:

Logical method (analysis, synthesis, induction, deduction, analogy, etc.). It was applied for the research of the process of proving the

circumstances of the commission of a corruption crime by performing a set of secret measures of obtaining information (control over the commission of crime, audio and video monitoring, interception of telephone conversations and other investigative actions, in particular, the seizure and analysis of documents, conducting interrogations, expert studies, etc.).

Dogmatic method helped to examine the content of international legal instruments regulating the limits of the possible use of artificial intelligence in criminal justice (Convention for the Protection of Individuals with Regard to Automatic Processing of Personal Data, Recommendation CM/Rec (2020)1 to Member States regarding the impact of algorithmic systems on human rights, Recommendation on the Ethics of Artificial Intelligence, etc.).

Monographic method made it possible to consider the works of the scholars, who investigated the issues of using electronic search systems and ensuring the balance of State interests and guarantees of human rights and freedoms during this process.

System and structural method was useful when studying informational systems used by the investigators during the investigation of criminal proceedings on corruption crimes (Unified State Register of Declarations of Persons Authorized to Perform the Functions of the State or Local Self-Government; information System "Arkan"; information and telecommunication System "Hart 1"; databases of the State Migration Service of Ukraine; State Registry of Real Property Right; Unified State Register of Vehicles; "Safe City" et al.).

With the help of comparative and legal method the rules of criminal procedural legislation of other countries ensuring a balance of the interests of criminal justice and guarantees of human rights and freedoms in the course of electronic search of information were reviewed (Germany, Great Britain, China, Singapore).

Sociological methods were applied when studying the decisions of the ECHR on this topic (Szabó and Vissy v. Hungary (2016); Centrum för rättvisa v. Sweden (2021); Tretter and others v. Austria (2010); Ringler v. Austria (2010); "Azer Ahmadov v. Azerbaijan" (2021); "Big Brother Watch and Others v. the United Kingdom" (2021)).

Legal and modelling method was used for determining the principles of regulating the

application of electronic search systems, databases, algorithms and artificial intelligence in criminal procedural legislation.

## Literature Review

The issues of using electronic search systems, ensuring the balance of State interests and guarantees of human rights and freedoms are the object of the research by a number of recognized experts and scientists. In particular, Hans Born and Aidan Wills (2012) examined them in the activities of intelligence services.

Cahn and Veiszlemleinin (2020) studied these problems within the application of digital technologies to monitor human movement, which were used during the COVID-19 pandemic. The authors stated that different biases in various types of surveillance operations should be taken into account as they may result in significant discrimination.

The issue of ensuring the rights and interests of the person under "digitalization" of criminal proceedings became the subject matter of scientific research in the work by Demura, Klepka and Krytska (2020). The article identifies and characterizes perspective vectors of digital transformation of pre-trial investigation through the prism of ensuring the rights and legitimate interests of the individual.

The research by Kaplina, Raimundas and Shumylo (2019) deals with the topical for modern science of criminal procedural law and law enforcement practice question of use in criminal procedure digital evidence.

Kireeva, Makhelai and Basalyk (2023) studied the issue of using of databases in the work of a criminal analyst of an operational search unit. They provided the concept of information-analytical system and characterized the main databases used by criminal analysts in their daily work and the procedure for their application.

Problematic issues related to the use of electronic evidence in the criminal procedural law of Ukraine were considered by Anhelenuik (2023). The Author draws special attention to the shortcomings of the regulation of the electronic evidence use in the legislation of Ukraine and the possibilities of their overcoming.

The monography by Skrypnyk (2022) is devoted to the use of information from electronic media in criminal procedural evidence. The author analysed theoretical foundations and foreign

experience of using digital information in criminal procedural evidence. The emphasis is placed on digital information as a means of proof under the criminal procedural legislation of Ukraine.

Despite a significant number of works, the key theoretical and practical aspects of the use of databases on the benefit of criminal justice when investigating corruption offences have not yet been covered. The reason for this is the lack of comprehensive scientific work aimed at highlighting and finding solutions to the most significant problems in this area.

## Results and Discussion

The conventions of the UN and the Council of Europe emphasize the need for law enforcement agencies to have effective means of effective means of evidence collection, with the possibility of conducting covert surveillance, the use of special investigative tools, access to financial information, means of detecting, tracking and seizing proceeds of crime. Accordingly, specialized bodies to combat corruption have special powers that are not available to ordinary law enforcement officers. At the same time, the implementation of such broad powers should be carried out in compliance with international human rights standards and be subject to external control (OECD, 2007).

Ensuring objective and comprehensive investigation of the circumstances of corruption crimes requires the prosecution to direct the investigation in such main areas as: 1) establishing the circumstances of the wrongful benefit, the wrongful removal/misappropriation of funds, property, providing preferences to third parties, which is defined as the direct object of the evidence of elements of a criminal offence; 2) investigation of the suspect's life style, his or her circle, the range of his (her) responsibilities, ownership of assets, including those held by front-line persons, which enables to reveal other facts of corrupt acts and enforce the sentence on the confiscation of property; 3) taking measures to locate the person suspected of committing a corruption criminal offense and is evading investigation and trial.

Proving the circumstances of the commission of a corruption crime is carried out by conducting a complex of covert measures for obtaining information: control over the commission of crime, audio and video monitoring, interception of telephone conversations and other investigative actions, in particular, the seizure

and analysis of documents, conducting interrogations, expert studies, etc.

Establishing the facts of corruption, the circumstances contributing to it, as well as investigation of the suspect's lifestyle, his or her circle, ownership of assets and his (her) whereabouts in case of evading the investigation and trial, requires first of all the use of investigative measures involving electronic resources to obtain information. A significant part of information about the person, his (her) lifestyle, connections, status is contained in open sources (Internet), as well as in special software complexes and databases of law enforcement agencies, State institutions, and commercial enterprises.

According to the developed and tested methods, in the investigation of corruption crimes, investigators use various information systems: the Unified State Register of Legal Entities, Individual Entrepreneurs and Public Organizations containing information on registered business entities, ownership structure, including beneficiaries;

The Unified State Register of Declarations of Persons Authorized To Perform The Functions Of The State Or Local Self-Government, where the information on property, income, expenses, financial obligations, private interests of all public servants can be found;

The Information System "Arkan" and the Information and Telecommunication System "Hart 1" are used to establish the fact of crossing the state border of Ukraine, as well as the vehicle and persons who crossed the border with the suspect;

Application of the databases of the State Migration Service of Ukraine allows the investigators receive information on the provision of any administrative services, including those related to the issuance or exchange of passport or temporary residence document.

State Registry of Real Property Right provides information on real estate objects owned by the person on the property rights, are either leased or otherwise entitled to use.

The subdivisions of the Ministry of Internal Affairs receive information regarding the possession of vehicles from the Unified State Register of Vehicles.

Information on the person's travel routes, in particular using vehicles, can be obtained upon the request from the "Safe City" information system.

Information about mobile terminal telephone connections is obtained for the purpose of establishing contacts and location during communication. Business entities providing services related to the delivery of correspondence may, can, upon request, present necessary information for the purpose of establishing the telephone numbers used by the person or his (her) location, addressees of postal correspondence.

Profiles in social networks are also investigated to establish the photo and video materials, other information that can be used to determine the persons' location and connections.

On behalf of investigators and prosecutors, National Agency of Ukraine for finding, tracing and management of assets derived from corruption and other crimes (ARMA) is authorized to collect information about the person's assets. ARMA has access to information, documents, automated information and reference systems, registers and data banks that are at the disposal of local self-government; data on the availability and status of accounts, transactions in banking institutions, professional capital market participants, organized commodity markets, foreign States agencies, enterprises, institutions and organizations, including banks, depository and financial institutions, private executors, auditors, notaries, appraisers, as well as experts, arbitration managers, liquidators, persons authorized by the Fund for Guarantee of Deposits of Natural Persons.

ARMA can receive information in an automated, remote mode and perform analysis of open data sources (OSINT) both in Ukraine and abroad. It also gets access to paid databases, uses information from social networks, mass media, journalistic information and other data from open sources. The basis for collecting and analysing information is a written request from an investigator, prosecutor or head of a pre-trial investigation body (Babikov et al., 2024).

The application of the "ANDE RAPID DNA" system enables law enforcement agencies to perform automated interpretation of DNA identifiers directly at the scene, as well as their profiling in less than two hours, which is actively used by investigative units of the National Police

and Security Service for the purpose of identifying the person. With the help of this equipment, it is possible to examine samples of epithelium from the oral cavity, blood stains, saliva, other biological traces from objects touched by the person.

The information subsystem "BLOKPOST" provides an opportunity (based on the relevant request), to search for the person on the territory of Ukraine by guiding and providing access to information about the wanted person to all police officers on their own technical devices.

A significant amount of information about the person is also contained in the search systems of technological IT giants: Google, Facebook, Apple, Microsoft, which accumulate and store information about the user's location, behavior, requests, income, political views, racial and ethnic affiliation, correspondence and metadata text messages (Forklog, 2020).

The information accumulated in the "Diia" electronic application makes it possible to explore a fairly wide range of issues related to social behaviour: bringing to administrative responsibility, participation in legal proceedings, existence of enforcement proceedings, tax debt. Taking into account that the entry to the "Diya" application is related to the provision of banking services, such as "Privat24", it is additionally possible to establish the IP addresses from which the person entered with the verification of his (her) identity.

Along with this, information gathering can be carried out by using malicious software, the application of which is performed by separate installation on the computer equipment of the subject of the investigation, with the aim of obtaining information contained on his (her) devices or using them as covert means of receiving and recording audio and video information on the content of conversations or events occurring around such a device by unauthorized activation of the user's microphone and webcam.

It is the amount of information contained in electronic information systems, databases, as well as obtained from other technical means and software complexes, that determines the need to use certain algorithms and artificial intelligence to optimize the search and systematize data important for criminal proceedings.

This led to the spread of OSINT information search systems, implementing the technology of

data collection and analysis from open sources, which is used in the interests of criminal justice by law enforcement officers.

OSINT is positioned as an exploration among available sources covering any information. The data about person, business entity can be obtained on legal grounds from free public sources. Generally, it is information from the Internet, but can also include data contained in open libraries, newspaper articles, press releases, and stored on various types of media. Based on the form of fixation, the search objects can be texts, film, photo, video recordings, materials located on websites about webinars, public events, conferences (Softlist, 2022).

The main sources of information, which help to create a profile of the object, are social networks, blogs, video hosting, forums, magazines, newspapers, television, radio, public materials of state structures, publicly available observations, reports, articles, reports, conferences, and information with limited access (regarding banking transactions, telephone connections, travel routes, real estate owned or used by a person, or people of his (her) circle and connections).

On the basis of the profile, pre-trial investigation bodies can establish the whereabouts, hidden assets, possible accomplices who facilitated or directly participated in the commission of corrupt acts, as well as receive other information that is not directly related to the subject matter of pre-trial investigation, but is related to private life and is sensitive for the person.

At the same time, according to the legislation of Ukraine, just the access to information on telephone connections and removal of information from electronic information systems and their parts, the access to which is restricted by logical protection system without the knowledge of the owner or user, requires the permission of the investigating judge; the implementation of other means does not need such authorization. The rest of the information from the databases can be obtained either at the request of the investigator, the prosecutor, directly through an electronic office, or by examining mobile devices, including using portable hardware and software complexes for forensic research, which allows to extract, decode and analyse evidence.

Therefore, acquisition and recording significant amount of electronic information for the benefit of criminal justice in Ukraine is outside the scope

of judicial control, and the development of technologies for collecting electronic evidence is substantially ahead of the regulation of such activities by criminal procedural legislation.

It should be noted that the ECHR has repeatedly emphasized the need for a balanced approach to the interference in private life and defining its limits.

In the case of Szabó and Vissy v. Hungary (2016), which concerned Hungarian legislation regulating secret anti-terrorist surveillance for national security purposes (in particular, “section 7 / E (3) Surveillance”), the applicants complained that they could be subjected to unreasonable and to offensive measures; the introduced regulations do not rule out abuse in the absence of judicial control.

The court, recognizing the violation of Article 8 of the Convention, stated that under current conditions, the fight against terrorism requires the government to resort to advanced technologies, including those enabling mass surveillance of citizens’ telecommunications to prevent crimes. Such wiretapping, given new technologies that allow the government to easily intercept masses of data, even on individuals outside the primary range of operations, could be applied to any Hungarian citizen. Besides, the Court drew attention to the fact that the permission to carry out the mentioned measures took place within the scope of the executive power, without assessing whether the interception of communications is strictly necessary in the absence of a judicial. Accordingly, in the opinion of the Court, Hungarian legislation did not provide safeguards to prevent abuse.

Notably, the Court also stated that there had been no violation of Article 13 (right of an effective remedy) of the Convention along with Article 8, reiterating that Article 13 could not be interpreted as requiring a remedy against the state of domestic law.

In terms of determining the procedure for access to biological samples, in addition to the generally recognized objects (blood, saliva, nails, hair, sperm, suturing agent, bucal epithelium etc.), it also refers to fingerprints, handwriting, speech and voice of a person, traces of a person’s scent and others.

This view is primarily due to the fact that the purposeful search and collection of information about a person and his (her) life as an

intervention in the most sensitive sphere, requires a balanced approach.

There are a number of other cases related to complaints about the collection and processing of personal data by law enforcement authorities brought before the ECtHR: *Centrum för rättvisa v. Sweden* (2021): a non-profit public interest law firm complains about Swedish state law concerning the secret surveillance of citizens;

*Tretter and others v. Austria* (2010). The case concerns amendments to the Law on State Authorities in Police Affairs, which entered into force in January 2008 and expanded the powers of law enforcement agencies to collect and process citizens' personal data;

*Ringler v. Austria* (2010) deals with the violation of the right to respect for private life and correspondence, the right to an effective remedy in similar matters.

In the case “*Azer Ahmadov v. Azerbaijan*” (2021), the Court drew attention to the fact that conduct of secret measures for obtaining information must contain personal data of the person in respect of whom they are conducted. Otherwise, it violates his (her) right to privacy guaranteed by the Convention.

In the case “*Big Brother Watch and Others v. the United Kingdom*” (2021), the applicants – 3 non-governmental organizations, a researcher, working internationally in the field of privacy and freedom of expression, and investigative journalists, alleged that they were likely subjects of surveillance by the UK intelligence services. Their fears sparked media interest after Edward Snowden's revelation, who is the former system administrator for the US National Security Agency (NSA).

During the consideration of the case, the Court examined three aspects of monitoring:

- 1) large-scale interception (monitoring) of telecommunications;
- 2) exchange of received intelligence information between the countries;
- 3) receiving communication data (billing information) from telecommunications operators and providers.

In the Decision, the Court stated that in accordance with the national legislation of the Great Britain, there were certain stages of the monitoring process, which included: interception of messages transmitted by telecommunications

channels; real-time application of filters to determine the significance of intercepted information; analysis of selected and stored material by an analyst.

The ECtHR previously found no abuses on the part of the United Kingdom's intelligence services; however, it identified insufficient independent oversight of the selection and retrieval processes, in particular information filtering criteria for subsequent selection and verification of intercepted data.

Following this, the court concluded that the national legislation did not meet the requirement of the “quality of law” and the criterion of “necessity in a democratic society”.

As for the receipt of billing information from telecommunications operators, the ECtHR drew attention to the fact that the legislation of the European Union requires such procedure to be limited to the purpose of combating serious crime, and access to such data had to be previously authorized by a court or other independent administrative body.

And in this matter, the domestic legislation of Great Britain turned out to be inappropriate, since it did not contain such guarantees, and the ECtHR did not find any violations in the existing procedure for exchanging intelligence information.

Non-governmental organizations have also repeatedly criticized experiments with the use of algorithms in criminal proceedings for the purpose of characterizing the person, on which the reservation in the European Ethical Charter on the use of artificial intelligence (AI) in judicial systems and their environment on the use of such algorithms with special restrictions is based.

Therefore, it is necessary to highlight two key issues in the context of research on the regulation of electronic search, collection and use of information on the person in criminal proceedings: 1) ensuring the balance between the interests of criminal proceedings and the guarantees of human rights and freedoms; 2) the limits of the possible use of algorithms, artificial intelligence for obtaining conclusions, individual profiles of a person, the influence of such information on making legal decisions in criminal proceedings.

To some extent, the issue of the balance of interests in the criminal procedural legislation of European countries has found its solution. Thus,

in the Federal Republic of Germany (FRG), the search measures of law enforcement agencies have been formally defined as some form of tacit measures of obtaining information under the name “electronic search”.

Chapter VIII “Seizure, control of telecommunications, computer search for possible offenders based on common indicators, application of technical means, use of undercover investigators and searches” of the German Criminal Code (Federal Ministry of Justice, 1998) of the Federal Republic of Germany defines system of secret measures of information, which includes: 1) seizure (the objects of which among others include computer files, electronic messages); 2) automatic comparison and transfer of personal data; 3) comparison of information for the investigation of the criminal act; 4) seizure of postal and telegraphic dispatches; 5) control of telecommunications; 6) measures applied without knowledge of the person to whom they apply (recording of conversations in publicly inaccessible places); 7) statements made in private outside housing; 8) receiving information about communication within the framework of telecommunications; 9) other measures applied without the knowledge of the person to whom they relate (monitoring); 10) measures applicable to mobile phones.

At the same time, such a measure as an online search using special software is not an element of the criminal procedure; it is regulated by other federal laws.

Automatic comparison and transfer of personal data, which involves the collection and analysis of information on the person from various databases, can be applied in cases where there are grounds to believe that a criminal act of a significant degree of danger has been committed.

Investigating the grounds for conducting such a measure, one should note a key criterion for recognizing the legality of interference in private life. Thus, the Constitutional Court of the Federal Republic of Germany, on the basis of an analysis of the content of secret forms of obtaining evidence in criminal proceedings, drew attention to the fact that when using the obtained evidence the first line of reference is to determine in which area such interference occurred and distinguished the following spheres: 1) social sphere (business relationships); 2) private sphere (private conversations, actions and communication in the domestic sphere, etc.); 3) intimate sphere (Holovnenko & Spitz, 2012).

Social contacts in the first sphere do not require special protection. In the second area, the interests of criminal proceedings must be weighed against the protection of the private. Interference in the intimate sphere is prohibited.

That is, the principle of proportionality is defined as one of the key criteria in the criminal procedural legislation of the Federal Republic of Germany when clarifying the existence of grounds for conducting special investigative actions.

The collection and accumulation of information in Great Britain for the benefit criminal justice is regulated by the Investigative Powers Act (Legislation, 2016), which gives broad powers to law enforcement agencies to collect, store, and analyse information, including the right to access banking, commercial information, intrusion into telephones, computers, as well as mass accumulation of personal data, including data on visits to certain Internet resources with the approval of the judge. A limited circle of law enforcement officials authorized to carry out such measures is also defined, and criminal liability for the abuse of such powers is established.

Analysis of the activities of law enforcement agencies of several other countries of the world authorized to prevent and combat corruption indicates that they use a wide range of databases and sources of electronic information in their activities.

Thus, the Independent Commission Against Corruption (Hong Kong) has the right to follow up on a court order and detect illegal financial transactions and assets hidden by a corrupt person in any form. These powers include checking bank accounts, conducting searches and seizing documents, as well as the right to require suspects to provide detailed information about their assets, income and expenses.

Special investigators of the Bureau for the Investigation of Corruption (Singapore) following the instructions of the prosecutor, the Director of the Bureau for Special Powers, may obtain access to the bank’s documentation, request any information on property in use or belonging to him or her or close persons, bank transfers or cash withdrawals, collect and analyse information on business activities, etc. (OECD, 2007).

Considering the aspects of searching, collecting and using information on the person on the

benefit of criminal justice, an extremely important trend of spreading the use of artificial intelligence during such activities and the consequences of the risks involved should be taken into account. As noted by the Secretary General of the Council of Europe Marija Pejčinović Burić, artificial intelligence is already with us: it changes the information we receive, influences our choices, and in the nearest future it will influence the work of governments and state institutions even more. Artificial intelligence presents both benefits and risks. The role of the Council of Europe is to ensure the protection and development of human rights, democracy and the rule of law in the digital environment (Council of Europe, 2023).

Determining the limits of the possible use of artificial intelligence in criminal justice remains quite problematic; however, the first steps of regulation the development of the basic principles of its use have already been taken at the international level.

Thus, the Convention for the Protection of Individuals with Regard to Automatic Processing of Personal Data (Council of Europe, 1981) introduced the basic principles of data protection, including: integrity of data collection and processing; their storage only for specified and lawful purposes; non-use in a manner that is incompatible with these purposes; to be adequate, appropriate and not excessive in relation to the purposes for which they are stored; to be kept in a form allowing the identification of data subjects no longer than is necessary for the purposes of storage. However, there is a reservation that even in the interest of criminal proceedings automated processing of data on racial affiliation, political, religious or other beliefs, as well as data relating to health and sexual life is prohibited, if domestic legislation does not provide appropriate guarantees (Article 6 of the Convention).

As involving AI in the sphere of justice raises a number of ethical issues, an important international act governing them was adopted – the European Ethical Charter on the use of Artificial Intelligence in judicial systems and their environment (European Commission for the Efficiency of Justice, 2018). The main purpose of the Charter is to increase the efficiency and quality of the administration of justice by processing the algorithms of court decisions and data while respecting the basic rights and freedoms guaranteed by the ECHR and the Council of Europe Convention on the Protection of Personal Data.

The Charter establishes five principles regarding the use of artificial intelligence in the administration of justice:

- the principle of observing basic human rights when using AI.
- the principle of non-discrimination, namely prevention of any discrimination between individuals or groups of individuals.
- the principle of quality and security, which requires the processing of court decisions and data in a secure technological environment.
- the principle "under the control of the user".
- the principle of transparency, impartiality and fairness.

Based on the mentioned Convention, the Committee of Ministers of the Council of Europe issued Recommendation CM / Rec (2020) 1 to Member States regarding the impact of algorithmic systems on human rights, which provides guidelines and the algorithm of necessary actions for effective protection of human rights and personal data. The measures provide for the legislative regulation of issues of access and use of information and the obligation of users and processors of personal data to submit adequate documentation to verify compliance with the law.

In addition, the Recommendation on the Ethics of Artificial Intelligence (UNESCO 2021) proposed the following basic conditions for the use of artificial intelligence, particularly those that may apply to criminal justice: 1) privacy must be respected, protected and encouraged at all stages of the use of artificial intelligence systems. The collection, use, transfer, storage and removal of data in such systems is carried out taking into account the standards of international law, regional and national norms; 2) the framework principles of data protection and their management mechanisms should be developed on the basis of the principles of multi-stakeholder interest, protected by judicial systems, and based on international principles of data protection and standards regarding the collection, use and disclosure of personal data, provided that there are legal purpose and the appropriate legal basis for processing; 3) algorithmic systems require properly assessing the privacy implications, and the actors of artificial intelligence are obliged to ensure accountability in the development and implementation of such systems, protecting personal information throughout the life cycle of such systems; 4) the control of artificial intelligence systems is not just about control by individual persons, but also, in necessary cases,

inclusive control by society; 5) delegating the control of artificial intelligence systems can be limited in number and do not deal with crucial issues; 6) the transparency and comprehensibility of such systems is a guarantee of the realization of the right to a fair trial; where there are substantial risks of adverse effects on human rights, the principle of transparency may be the basis for the disclosure of algorithms or databases.

### Conclusion

The use of electronic search systems during the investigation of corruption crimes is an effective tool contributing to the performance of criminal justice tasks, which provides quick, objective investigation of the circumstances of the case, establishes the whereabouts of the person, evading pre-trial investigation and trial, identifies assets and ensures execution of punishment through confiscation of property.

Along with this, such activity is related to interference in private life and significantly limits human rights and freedoms. Accordingly, the use of electronic search systems, databases, algorithms and artificial intelligence is subject to detailed regulation in criminal procedural legislation, taking into account such principles as:

- 1) Balancing the interests of the criminal justice system and human rights and freedoms, thus limiting, collecting and using information as an exceptional measure due to the gravity of the offence;
- 2) decision on permission to search for, collect and use private information must be considered as a form of tacit receipt of information with the introduction of an appropriate judicial control;
- 3) application of algorithms, artificial intelligence for searching, collecting and analysing information cannot replace a person, whose sphere of control includes interpretation and conclusions regarding the information obtained;
- 4) misuse of databases by law enforcement agencies, software complexes allowing interference in the person's private life, including their application without necessary legal grounds, is subject to criminalization, and results obtained shall not be admissible as evidence of guilt.

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## The use of the SmartCat platform for the development of soft skills in masters of philology

### Використання платформи SmartCat для формування м'яких навичок у магістрів-філологів

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#### Abstract

Skill requirements and implementation of new information technologies drive changes in the professional training for future technical translators, including the development of both highly professional and soft skills. The purpose of this study was to develop soft skills in Masters of Philology and future technical translators in the process of implementing the group project using the SmartCat Cloud Platform. The soft skills in Masters of Philology required to implement the group project using the SmartCat Cloud Platform have been identified and analyzed: planning and time, workload, stress management skills; skills of compliance with project implementation terms, instructions and technical specifications; teamwork skills, including in a virtual media, using modern communication technologies; responsible use of information technology for professional purposes; continuous self-assessment, updating and developing

#### Резюме

Потреба в робочій силі та впровадження нових інформаційних технологій потребують змін у професійній підготовці майбутніх технічних перекладачів, розвитку як вузькопрофесійних, так і м'яких навичок. Мета цього дослідження – формування м'яких навичок у магістрів філології і майбутніх технічних перекладачів у процесі виконання групового проекту з використанням хмарної платформи Smartcat. Проаналізовано та виявлено м'які навички магістрів філології, необхідні для виконання групового проекту з використанням хмарної платформи Smartcat: навички планування та управління часом, робочим навантаженням та стресом; навички дотримання термінів реалізації проекту, інструкцій та технічних умов; навички роботи в команді, у тому числі у віртуальному середовищі, з використанням сучасних комунікаційних технологій; відповідальне використання інформаційних

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competencies and skills through personal strategies and co-education. The didactic opportunities of the SmartCat Cloud Platform have been revealed, enabling instructors to monitor and evaluate the activities of both the group as a whole and individual activities of group members. Overall, the SmartCat platform is a tool for the development of soft skills needed for a future professional career of technical translators.

**Keywords:** development, soft skills, Masters of Philology, SmartCat Cloud Platform, information technology.

## Introduction

At present, the work character and competency requirements for a technical translator are quickly changing (Zetsche, 2023). There are over 600 job titles used on the LinkedIn profiles of employees working in Language Service Providers (LSPs) globally (Bond, 2018). In particular, experts in information system analysis, information technology specialists, software developers, researchers in the field of philology, linguists, translators and interpreters, teachers of foreign languages, word-processing and data collection operators, project managers, project management professionals (Faes, 2018). Demands on hard and soft skills of future technical translators are growing (Zinukova, 2021).

Today, employers need specialists with work experience and professional knowledge, including soft skills significantly affecting operational efficiency. The UK Engagement Survey has shown that students did not realize the importance of soft skills for professional progress, and the influence of universities was limited (Havergal, 2015). Nevertheless, the translation services workforce analysis reflects a noticeable trend in considerable interest of employers in soft skills of job applicants. Most employers consider them to be as important as hard skills (Hirudayaraj et al., 2021; Horváth-Csikós et al., 2023; Mytsenko & Rusanovska, 2023).

An experience in customer and translator database management, knowledge of specialized translation programs (Computer-Assisted Translation (CAT)-tools), and the ability to use them have also proven to be important (Tarasenko et al., 2021). Especially decisive have been a confident use of a personal computer, an

технологій з професійною метою; постійна самооцінка, оновлення та розвиток компетенцій та навичок за допомогою особистих стратегій та спільного навчання. Виявлено дидактичні можливості хмарної платформи Smartcat, що дозволяють педагогам контролювати та оцінювати діяльність як групи загалом, так й індивідуальної діяльності членів групи. Загалом платформа SmartCat є засобом формування м'яких навичок, які необхідні для майбутньої професійної діяльності технічних перекладачів.

**Ключові слова:** розвиток, soft skills, магістри філології, платформа Smartcat, інформаційні технології.

experience in organization and management of translation and interpreting projects, stress tolerance, teamwork skills, sociability, diligence, ability of independent decision-making, taking responsibility, a focus on results. The workforce requirements and introduction of new information technologies require changes in the professional training of future translators, development of both hard and soft skills. The study conducted in the scope of this work is aimed at identifying and developing soft skills in masters of philology in the process of a group project implementation based on the SmartCat platform.

The purpose of this study was to develop soft skills in Masters of Philology using the SmartCat Cloud Platform.

To achieve the goal, the following objectives needed to be met:

- to determine the role functions of an interpreter (manager, translator, post-editor) to model them in the educational group project;
- to clarify the soft skills of masters necessary for the high-quality implementation of the group project;
- to develop soft skills online in Masters of Philology using the SmartCat platform;
- to determine the didactic capabilities of the SmartCat Cloud Platform to enable teachers to monitor and evaluate the activities of both the group as a whole and the individual activities of group members.

## Literature Review

The scope of the translator's tasks is determined by the translation industry, which is undergoing substantial changes: a growing need for professional networking and cultural communication; major changes in the interpreter qualification requirements; a replacement of classical translation and an ongoing diversification of a translation profession; a growth of virtual translator teams; an increasing need for organizing the work with terminology, generating multilingual terminological and text databases; software localization; continuous integration of the translation profession with special disciplines. Changing market requirements have resulted in expanding the social roles of a translator. Translators, customers, translation managers, text authors, editors, experts and consultants specialized in a particular subject area are participants in the activity of professional translators (Pattison & Cragie, 2022; Şahin & Kansu-Yetkiner, 2020).

According to Esselink (2022), a translation project can be successful only if translations are executed on time, within budget and in accordance with agreed quality standards. Any professional activity, and a translator activity in particular, is not possible without reliable and easy-to-use tools (Bowker, 2022). Proponents of the situated translation theory argue that the translation process is carried out not only in the translator's mind but also by complex systems including people, their specific social and physical environment, and all their cultural prerequisites (Risku & Rogl, 2020). Risku (2010) considers these prerequisites, including computer information technologies (text processors, online research tools, translation memories), as a means of translator's activity.

Zetzsche (2023), a professional technical translator, offers the following classification of the translator's tools according to their functional feature: tools providing translators with specific functions (resource search, terminology management, project management, word count, software localization); tools providing functions to better use of translation aids (term and text extraction, transformation, text justification, quality assurance); tools integrating a wide range of functions (translation tools, applications for complex file formats, development of reusable translation and terminology databases).

According to Pym (2011), these tools are not just supplementary ones for the translator's activity. They change the very nature of the translator's cognitive activity, social relations, and professional status. Computer-assisted

translation (CAT) tools are currently one of the main approaches to the professional work of translators. CAT techniques provide translators with the tools to automate a translation project while leaving them the right of decision-making and free correction of translation. The main objective of CAT tools is to shorten the time needed to translate a document via machine translation. It is possible by reusing translated content (also known as translation memory (TM)), presenting prepared parts from TM, automatic translation according to glossaries, automatic verification of the translation quality, etc. The CAT tools also allow to use checking for grammar or spelling, terms management, specific dictionaries, term databases, and text indexers. It helps to conform the translation with the source text, manage projects and translation memories, as well as automate translation work. CAT tools play an important role in the curricula of international universities for the translators' training (Tarasenko et al., 2020).

Alotaibi (2014) & Fernández-Parra (2016) have shown that the insufficient use of CAT resources as language learning tools in universities happens both because the teachers do not know the didactic capabilities of the systems as well as teachers and students are not prepared to work with them. The guideline for the training of future translators should be the coordination of their training programs with the requirements of the translation services market. The Ukrainian standard of higher education in specialty 035 "Philology" for the second level of higher education notes that a master should be prepared for effective interaction in a professional team and with representatives of other professional groups of different levels, as well as be able to plan, organize, implement and present research or innovative developments in a particular philological field, in particular, applied linguistics. Thus, an important issue is to develop master's skills in working with both CAT tools and soft skills.

However, the analysis of the Educational and Professional Program content of masters in Philology in Ukrainian universities shows that the solution to this problem is fragmented and must be addressed.

There are several approaches to the process of developing soft skills. (Devadason et al., 2010), are focusing on the development of soft skills in the teaching and learning process through integrated inter-disciplinary courses, rather than separate academic subjects for university students.

The study by Rashidi et al. (2018) considers soft skills as interpersonal qualities that a person possesses, which are developed through an active participation of students in collaborative learning activities. Hard skills and soft skills have a close and inescapable connection complementing and balancing each other (Setiana et al., 2019).

The most advantageous way to activate the formation and further development of the soft skills is the implementation of interdisciplinary projects. The effectiveness of using interdisciplinary project-based learning for the soft skills development has been shown in the studies by (Vogler et al., 2018), (Cardoso-Espinosa et al., 2021), (Younis et al., 2021) and (Licorish et al., 2022). Research have shown that the interdisciplinary character of project-based learning ensured essential aspects of student education which were difficult to implement within traditional classroom learning. The results have also emphasized the importance of inter-disciplinary collaboration of teachers within the framework of the project-based learning experience.

The work by (Almonte et al., 2023) has proven the effectiveness of the soft skills development as a part of mandatory training course, that has been confirmed by both students and employers. To raise awareness among students about soft skills in academic and professional activities, researchers have proposed implementing the soft skills development in undergraduate and graduate programs.

A literature analysis has shown that the education of future translators should be guided by coordinated training programs with the requirements of translation services market, which has been undergoing major transformations since the profession of a linguist has becoming increasingly specialized and multidisciplinary, that is impossible without reliable and easy-to-use tools, such as CAT platforms. Studies have revealed a need for developed soft skills to maintain a collective character of a modern translator work. Despite this, there is a limited number of works focused on the development of soft skills in future translators.

We believe that the solution to this problem is urgent and requires specially organized study. We pay a special attention to the development of soft skills in masters - future translators in the process of the group project implementation by using the SmartCat platform. Additionally, the

study discusses the didactic capabilities of the SmartCat platform, which can motivate teachers to use it in the academic process.

## Methodology

The study employed the following methods: a content analysis of the study results from scientists on the development of soft skills; the use of information technology in the training process for future technical translators; a method for monitoring the activity and communication process of group members on the SmartCat Cloud Platform and in the Mentor distance learning system; an online questionnaire using Google Forms to determine the attitude of masters to using the SmartCat Cloud Platform; qualitative approach to data collection, analysis of Wilcoxon Signed-Rank-test and Kruskal-Wallis Test Calculator.

## Participants

We conducted the study at the Department of Applied Linguistics, National Aerospace University n. a. N. E. Zhukovsky "KhAI" during 2021 – 2023 academic years. The number of students participating was 48 masters, ten of whom were men, and thirty-eight masters were women. Groups were formed at the request of the students using a learner-centered approach taking into account the rights, choices and desires of individual students. Such groups provided comfortable conditions for working and learning cooperation of the students. It was impossible to form gender-homogeneous teams due to a small number of young men (18%). Nevertheless, the men were assigned to different teams in the project. Choosing the number of students in the group, we were guided by the recommendations of Davies (2009).

## Instruments

Each team member had a certain role: a manager, a translator, and a post-editor. The main functions of the manager included creating a project (creating a project activity in the project system and a project schedule, recruiting a team for project implementation, assigning salaries to project participants, distributing tasks between the project participants, monitoring the task completion by the project participants, choosing machine translation tools for text, defining requirements for the translation quality). The main functions of the translator included preliminary text editing (checking the grammatical, spelling and logical correctness of a source text; changing the word order at the level

of phrases and sentences; replacing idiomatic expressions; changing complex punctuation). Furthermore, entering the original and target languages, creating a glossary of terms in an xlsx file, attaching an xlsx file to a project, editing a glossary, and creating a TM, saving the TM in a file and text translation were also integrated. The main functions of the post-editor included text normalization to a single style after a machine translation, composing the description of typical translation errors, editing a glossary of terms and TM. The group project was organized using the SmartCat Cloud Platform. Constraints for conducting the educational group project were the time of the project and limited free options of the SmartCat Cloud Platform. The project implementation time were limited to 4 weeks.

### Procedures

We implemented the training group project within the academic subject “Information technology usage in linguistic research” which was learned by first-year masters in the first semester. The purpose of the group project was to create a terminological dictionary covering the aircraft industry term system. The topic was relevant because the existing terminological aircraft fund needed to be complemented and upgraded. As part of the group project, we gave each group the task of compiling a glossary (each group created 22 terms for a total of 260 terms), including an aircraft terminology system and the TM for texts from the aircraft industry. Based on the created glossary and TM, we checked the translation quality of aviation technical tests. The Cloud Platform SmartCat was used to implement the group project as well as organize, communicate and monitor the group work of masters. The group and individual results of the training group project implementation were documented via the university-wide distance learning Mentor system using the Moodle platform.

After the training group project completion, a teacher, who acted as an expert, measured the masters’ grade of soft skill development. The study included 7 stages. At the first stage, under the Order of the Ministry of Education and Science of Ukraine No. 871 (2019) for the specialty 035 “Philology” and following European Master's in Translation program (Emt Competence Framework, 2022), we determined the soft skills for Masters of Philology necessary for the group project implementation by a virtual team based on the SmartCat Cloud Platform: skills of planning and managing time, workload and stress; skills to comply with project

implementation deadlines, instructions and specifications; teamwork skills, including in a virtual environment, using modern communication technologies; responsible use of information technology for professional purposes; constant self-assessment, updating and development of competencies and skills through personal strategies and collaborative learning. At the second stage, for all roles in the group, the teacher rated actual levels of soft skills development in masters following the European standard for the training of translators of the European Masters in Translation program and using the technology tools for quantitative measurement of the education quality in an educational institution by Yelnikova G.V. (2001). At the third stage, masters planned their work in the group using the activity of the “Forum”. They determined the goal, formulated the project tasks, drew up a schedule for the project, distributed roles in the group, and chose the means of implementing the project and communication in it. At the fourth stage, the masters carried out the project. At the fifth stage, masters produced individual reports on the activity implemented within the group project and uploaded reports for an assessment into the university-wide Mentor distance learning system based on the Moodle platform. At the sixth stage, under the schedule for the group project implementation, the presentation of the project results occurred in the Google Meet online conference in the presence of other groups. At the last stage, the teacher rated the levels of soft skills development in Masters of Philology after the group project implementation. To assess the significance of the results obtained, the Wilcoxon Signed-Rank Test was used. We formulated two hypotheses:

H0: positive changes (shifts) in the level of soft skills development in Masters in the process of the group project implementation using the cloud-based SmartCat platform are random.

H1: positive changes (shifts) in the level of soft skills development in Masters in the process of the group project implementation using the cloud-based SmartCat platform are non-random.

The Kruskal-Wallis Test Calculator was used to determine whether there were differences in the three groups (n1=19, 2021; n2=15, 2022; n3=14, 2023) regarding the average value of the softskills developed by the masters in the process of the group project implementation using the SmartCat Cloud platform.

### Results

Masters were adults, socially established individuals who made their own decisions, actively regulated their behavior, and had a C1 level of English proficiency, so they played the leading role in organizing the group project. The main feature of the group project implementation was the process of self-determination of its organization and implementation parameters. A teacher created favorable conditions for the group project and helped the masters to identify their needs. Such organization of the training project made it possible to achieve the following learning outcomes for masters within the academic discipline "Information technology usage in linguistic research". In particular, to

formulate the goals and objectives of both the group project and the individual activities of each participant; to develop a schedule for completing the group project tasks; to justify the means of the group project implementation; to critically analyze the results of activities in the group project; to demonstrate teamwork roles depending on experience and practical interests; to efficiently use the SmartCat Cloud Platform to perform professional tasks in the group project; to manage, regulate and control the work; to organize the workplace; to manage time correctly; to meet deadlines. The study results are presented in Table 1.

**Table 1.**  
*Results of the Wilcoxon Signed-Rank Test*

Parameter	Value
<b>P-value</b>	5.961e-8
Surprisal (S-value)	23.9999
Effect Size (r)	0.8792
Z	5.42
W, (W-, W+)	0, (0, 741)
Number of pairs (N)	48
Non-zero difference pairs (n)	38
Ties Correction	94.5
S.E	68.266
Average of differences ( $\bar{x}_d$ )	2.9375
SD of differences ( $S_d$ )	2.0043
Normality p-value	0.001068
Skewness	0.07283
Skewness Shape	Potentially <b>Symmetrical</b> (pval=0.832) 
Excess kurtosis	-0.5962
Kurtosis Shape	Potentially <b>Mesokurtic</b> , normal like tails (pval=0.377) 

Source: systematized by the authors

Results of the Wilcoxon Signed-Rank Test indicated a significant difference between Before (Mdn = 5, n = 48) and After (Mdn = 9, n = 48),  $Z = 5.4$ ,  $p < 0.001$ ,  $r = 0.9$ . Since the  $p$ -value  $< \alpha$ ,  $H_0$  was rejected and  $H_1$  was accepted, the positive change in the developed level of soft skills in masters in the group project using the cloud-based SmartCat platform was non-random.

The calculation results have shown insignificant differences at two significance levels ( $p=0.01$  and  $p=0.05$ ). We have explained this result by the following reasons. In all three groups, the same teachers provided support, guidance and motivation for the masters to complete the group project using the SmartCat platform. The survey results have shown that 60% of the masters had practical experience working in a team, and they

shared their experience with other project participants. The educational goals and objectives of the project were defined and notified to all project members, which also contributed to a close interaction and activity in the project. The students dynamically communicated with each other and shared their thoughts and ideas using various digital technologies and the SmartCat platform. This may also have allowed to achieve similar performance levels in their work. Thus, a combination of clear goals, effective use of tools, interaction within the group, and support from teachers have resulted in the similar level of soft skills developed in the three groups.

The group project implementation was effective if the masters were personally interested in it and when the tasks performed by them met their

practical goals. The survey result of the masters has shown the priority motives for the project implementation: “Getting information about the functionality of the cloud-based SmartCat platform” – 23% of respondents, “Terminology glossary development in the aircraft industry” – 20% of respondents, “Translation memory development” – 18% of respondents. The responses have shown that the masters had positive motives in mind while implementing the project. It happened because the masters coordinated the significance and content of the group project with their practical and cognitive needs: to get a job, create a glossary and TM to use in practical classes on the translation theory or during research work, as well in the future. The remaining 39% of masters correlated their participation in the group project with the need to complete tasks as a part of the educational process. The analysis of discussions in the “Forum” made it possible to reveal the main challenges of planning the group project. When designing the project goals and objectives, some masters replaced the goals with the content of training: “to know the main functions of the SmartCat Cloud Platform”, “to know the features of creating a glossary in the SmartCat Cloud Platform”. They formulated goals that were not set and had a general wording from which it was difficult to understand the project result. For example, “to be able to use the capabilities of the SmartCat Cloud Platform in the process of technical text translation”. They formulated goals that met their private interests and planned their activities: “learning how to create a project in the SmartCat Cloud Platform”. The masters formulated some tasks with the general phrases “to define aviation terms”. Several tasks were excessively detailed “selecting a project creation mode”, and “selecting a mode of team members”. When planning the schedule for completing tasks, they reduced (compared to the objective) the needs necessary for the task duration and did not account for the need to prepare for the next task. When choosing the means of implementing the project, the masters preferred polytechnic dictionaries over specialized dictionaries, or they did not indicate the need to use dictionaries at all.

After the project implementation, the masters participated in the survey. Answering the question “Do you find it useful to use the SmartCat Cloud Platform in the educational process for masters?”, 85% of masters have found the use of the SmartCat Cloud Platform beneficial. To the question “What advantages of using the SmartCat Cloud Platform in the group project can you note?”, the masters answered: an ability to complete tasks online (100%); an

ability to work using different hardware platforms (65%); a convenient intuitive interface (74%); an ability to visualize and understand the features of a factual virtual team of translators (54%); a clear split of work between team members (62%); collective responsibilities for the project (35%); a visual representation of the work intermediate results (52%); an ability to translate different segments by team members simultaneously (68%); an ability to get instant answers to questions online (46%); a translation with a simultaneous discussion of translation issues in the comments (37%). An analysis of the masters’ answers has shown that the use of the SmartCat Cloud Platform contributed to increased motivation and development of needs and interests in learning. It also shaped their feelings of belonging to the team and the conditions for collaboration while solving common problems. It helped to develop partnerships to get the most effective results. The participants noted an excessive initiative of some team members in discussion and decision-making (35%) and a passivity of the others (15%) as the main difficulties of the training group project.

## Discussion

Researchers are currently paying a great deal of attention to the problem of developing soft skills. It has come to play a major role in curricula along with hard skills (Massey, 2023). However, according to Cimatti (2016), it is quite difficult for teachers to keep track of them and evaluate. An analysis of studies has shown no uniform definition and structure of soft skills. It is common ground that soft skills are not specialized and, due to their versatility, are the most essential goal for all professional persons. They influence the effectiveness of both masters’ educational process and their future professional activities. The development of soft skills should occur throughout the entire stage of students’ learning at higher educational institutions.

A study analysis has shown that the use of online tools contributed to the development of soft skills necessary for the future professional career of translators (Herget, 2020). Although the role of up-to-date online tools is considerable for the activities of professional translators, they are rarely used at universities in the training programs for masters in philology (Massey, 2023). We fully endorse the view of Fernández-Parra (2016) that this is due, on the one hand, to the fact that teachers are often unaware of the didactic capabilities of the systems and do not integrate them into university

training programs for future technical translators, and on the other hand, to the fact that Masters do not realize the importance of using online tools for their professional development.

Wilson et al. (2012) have shown a high effectiveness in the development of soft skills given the environments of operational training. At the implementation phase of the educational group project, we limited the tasks of each master in the group and ascertained the degree of individual responsibility for the work. A project manager created a “project activity” using the SmartCat online platform, fixed time limits for the project and invited a translator and a post-editor to participate in the project. After translator's and post-editor's confirmation of their participation in the project, the manager fixed a wage rate for them, assigned tasks among the project participants, defined the source language and the target language, and also added a free-to-play machine translation software Microsoft Translator, connected automated translation quality control, as well as specified requirements for the development of a glossary and a translation memory for the translator and the post-editor.

The translator selected aviation terms and saved them to an xlsx file. When choosing terms from the sphere of aircraft engineering, the masters were not limited to the project requirements formulated by the teacher. To select unique terms, sort them, and evaluate their frequency in technical literature, the free LexTutor service was chosen. They then used Excel application to create a glossary that enabled a master of translation to begin the work together with the manager. The master of translation uploaded the glossary generated by Excel into the project. When the terms in the glossary were confirmed by a translation quality manager, the translator saved the glossary in the project and used it for machine translation of text fragments. It has provided the relevance and uniformity of terms. The translator's responsibilities also included creating the translation memory (as a means of translating technical text) in Excel and loading it into the project. The post-editor reviewed and edited the translated fragments as soon as they were approved. Commenting on segments in the SmartCat Cloud Platform allowed the post-editor to leave comments and the translators to ask clarifying questions about the correctness of the translation in context. The editor ensured a uniform style for presenting the text, indicated and analyzed common errors, edited and saved the translation memory into a file. This has enabled to develop skills of analysis, critical

thinking and self-control. All team members worked on the project at the same time without violating anyone's work pace. They had access to state-of-the-art translation resources that allowed to guarantee the project's completion on time and develop self-management and self-learning skills. Teachers monitored the activity of team members using individual progress indicators in the SmartCat project and data about the participants displayed in the SmartCat interface (who worked in the project, which documents were in the work within the project, what language pair was used in the project). A visual representation of the task completion allowed both the masters and the teachers to assess the progress at all main stages and the amount of work completed and remaining within the project. The exchange of ideas and prompt discussion of current issues as part of the project were carried out using the option “Chat” in the cloud-based SmartCat platform. This has promoted the development of communication, collaboration and leadership skills.

Thus, the study results have shown that the Smartcat platform could be used to develop the soft skills of masters, enriching their learning experience and preparing them for a successful career in various educational contexts: teamwork and communication, project management, editing and feedback, independent learning and research.

These project activities of the masters have resulted in a public statement at the Google Meet online conference, where they conducted reflection-based analysis of their activities, demonstrated ways to solve project problems and practical application of the results. Such an organization of the educational project has helped to develop the following soft skills: to formulate the goals and objectives of both the group project and the individual activities of each participant; develop a schedule for completing group project tasks; justify ways to implement the group project; critically analyze the results of one's own activities in the group project; demonstrate teamwork roles based on one's own experience and practical interest; use the SmartCat Cloud Platform responsibly to complete professional tasks in the group project; manage, regulate and control own work; organize the workplace; regulate one's time; comply with timeframes for the educational group project completion.

## Conclusions

It has been shown that soft skills allow specialists to navigate the environment, interact with co-workers, work effectively and achieve their goals, complementing hard skills. Soft skills have been defined to influence the effectiveness of both Masters' training efforts and their future professional activities. It has been revealed that the development of soft skills should begin in a university environment, as they are essential for the academic and professional advancements of future specialists. The soft skills in Masters of Philology required to implement the group project using the SmartCat Cloud Platform have been identified and analyzed: planning and time, workload, stress management skills; skills of compliance with project implementation terms, instructions and technical specifications; teamwork skills, including in a virtual media, using modern communication technologies; responsible use of information technology for professional purposes; continuous self-assessment, updating and developing competencies and skills through personal strategies and co-education. The interpreter role-functioning (manager, translator, post-editor) has been defined for modeling them in the training group project.

The didactic opportunities of the SmartCat Cloud Platform have been revealed, enabling instructors to monitor team goals and objectives as well as their content, compliance with the rules of conduct in the team by each participant, supervise the stages of teamwork, control communications between project participants, evaluate the whole group work as well as a personal contribution of each participant to the project results. The findings have shown the effectiveness of developing soft skills in Masters of Philology in the process of implementing the group project using the SmartCat Cloud Platform.

### Recommendations

The described experience is interdisciplinary since it can be transferred to other academic subjects of educational industries. The research conducted does not cover all aspects of the issue. Further study requires the use of training group projects performed on the SmartCat Cloud Platform in studying such professional subjects as "Translation of Scientific and Technical Texts in Aviation", "Academic and Professional English Language".

### Study Limitations

Limitations for conducting the educational group project were the time of the project and limited free options of the SmartCat Cloud Platform. We limited the project implementation time to 4 weeks. As a part of the educational group project, we used the following free functions of the SmartCat Cloud Platform: creating projects; engaging an unlimited number of users; assigning wages to users; appointing specialists to different stages of working with a text (translation, editing, proofreading), monitoring the work of performers; creating and managing TM and terminological glossaries; automatic quality checks; connecting industry dictionaries, recruiting the team, translating a limited amount of text segments.

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## Alternative ways of resolving disputes in the field of contract law

### Альтернативні способи вирішення спорів в сфері договірної права

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#### Abstract

In today's world, the speed and efficiency of resolving disputes in the field of contract law are of great importance for businesses and individual participants. Traditional litigation is often notorious for its length and high costs. In this regard, alternative methods, such as mediation and arbitration, are gaining more and more popularity. Their advantages, such as speed, confidentiality, and greater party autonomy, make them attractive for the resolution of contractual disputes. The article explores alternative dispute resolution methods in the field of contract law, including mediation, arbitration, and confidential settlement. The purpose of the study is to analyze alternative ways of resolving disputes in the field of contract law. Research methodology includes such methods as empirical method, comparative analysis method, forecasting method, and logical methods. As a result of the study, alternative ways of resolving disputes in the field of contract law and the advantages of each method compared to traditional court proceedings are considered and also provide examples of successful application in practice. The results of the

#### Анотація

У сучасному світі швидкість та ефективність вирішення спорів у сфері договірної права має велике значення для бізнесу та індивідуальних учасників. Традиційне судочинство часто відоме своєю тривалістю та високими витратами. У зв'язку з цим, альтернативні методи, такі як медіація та арбітраж, набувають все більшої популярності. Їхні переваги, такі як швидкість, конфіденційність і більша автономія сторін, роблять їх привабливими для вирішення договірних спорів. У статті досліджено альтернативні методи вирішення спорів у сфері договірної права, зокрема медіацію, арбітраж та конфіденційне врегулювання. Метою дослідження є аналіз альтернативних способів вирішення спорів в сфері договірної права. Методологія дослідження включає такі методи як: емпіричний метод, метод порівняльного аналізу, метод прогнозування, логічні методи. У результаті дослідження розглянуто альтернативні способи вирішення спорів у сфері договірної права та переваги кожного методу порівняно з традиційним судочинством, а також

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study show that alternative dispute resolution methods in the field of contract law, such as mediation, arbitration, and confidential settlement, have some significant advantages compared to traditional litigation. In addition, current trends in the use of these alternative methods in modern contract law are investigated. The study also indicates that the success of these alternative dispute resolution methods in the field of contract law depends on mutual trust between the parties, who are ready to work together to achieve a mutually beneficial resolution of the conflict.

**Keywords:** mediation, arbitration, contract law, dispute, conflict resolution, litigation, out-of-court dispute resolution, negotiations, dispute resolution.

## Introduction

In today's world, where business and personal relationships are becoming increasingly important, dispute resolution in the field of contract law is becoming a necessity. However, traditional methods of resolving disputes through court procedures are often time-consuming, costly, and conflictual. In this regard, the popularity of alternative methods of dispute resolution, such as mediation, arbitration, and confidential settlement, is increasing.

Understanding and analyzing these alternative methods will help change the approach to dispute resolution in the contractual sphere, helping to reduce conflicts, increase efficiency, and ensure greater stability in business and personal relationships.

The object of research is alternative methods of dispute resolution. The subject of the study is the resolution of disputes in the field of contract law through the use of alternative methods, such as mediation, arbitration, confidential settlement, and others.

The tasks of the study of alternative methods of dispute resolution in the field of the contract include:

1. Analysis of the main alternative dispute resolution methods such as mediation, arbitration, confidential settlement.
2. An assessment of the advantages and disadvantages of each alternative method compared to traditional litigation.

надає приклади успішного застосування в практиці. Результати дослідження показують, що альтернативні способи вирішення спорів у сфері договірної права, такі як медіація, арбітраж та конфіденційне врегулювання, мають деякі значні переваги порівняно з традиційним судочинством. Крім того, досліджено актуальні тенденції у використанні цих альтернативних методів у сучасному договірному праві. Дослідження також вказує на те, що успішність цих альтернативних методів вирішення спорів в сфері договірної права залежить від взаємного довірчого ставлення між сторонами, які готові до спільної роботи з метою досягнення взаємовигідного вирішення конфлікту.

**Ключові слова:** медіація, арбітраж, договірне право, спір, вирішення конфліктів, судочинство, позасудове вирішення спорів, переговори, шляхи вирішення спору.

3. Identification of trends in the application of alternative dispute resolution methods in the field of contract law.

Regarding the terminology, we note the definitions related to alternative methods of resolving disputes in the field of contract law:

- Mediation is a dispute resolution process in which an independent third party, a mediator, helps the parties to a dispute reach a mutually acceptable resolution. The mediator has no right to impose a decision, but only assists the parties in reaching a mutual agreement (Sharaya, & Pankratova, 2022).
- Arbitration is an out-of-court dispute resolution process in which disputes are heard and decided by an independent arbitral tribunal. The arbitral award shall be final and may be enforced in court (Yanovytska, 2019).
- Confidential Settlement: This is a confidential dispute resolution process in which the parties settle out of court with the help of a mediator or consultant. The details of the agreement are kept confidential (Sharaya, & Pankratova, 2022).
- Contract law: This is the branch of law that governs the conclusion, performance, and breach of contracts between parties (Yanovytska, 2019).
- Out-of-court dispute resolution is the use of alternative methods, such as mediation or arbitration, to resolve disputes outside of court (Podkovenko, 2018).

- Negotiation is a process of mutual discussions and agreement of positions between the parties to resolve the dispute or conclude an agreement (Yanovytska, 2019).

Studying alternative conflict resolution methods in the current context is crucial for several reasons, highlighting their relevance and potential benefits. Here are the key points elaborated:

1. **Increasing Complexity of Conflicts.** In today's world, conflicts have become more complex and multifaceted due to globalization, cultural diversity, and technological advancements. Traditional conflict resolution methods, such as litigation, may not be adequate to address these complexities. Alternative methods, such as mediation, arbitration, and negotiation, offer more flexible and tailored approaches that can better handle the nuances of modern disputes.
2. **Cost-Effectiveness.** Litigation can be prohibitively expensive, both in terms of financial costs and time. Alternative conflict resolution methods often provide more cost-effective solutions. Mediation and arbitration, for instance, typically require less time and resources, making them accessible to a broader range of individuals and organizations.
3. **Preservation of Relationships.** Unlike adversarial legal proceedings, alternative methods emphasize collaboration and mutual respect. Mediation and negotiation focus on finding a mutually acceptable solution, which can help preserve and even strengthen relationships between parties. This is particularly important in business, family, and community disputes where ongoing relationships are valuable.
4. **Confidentiality.** Many alternative conflict resolution methods offer a higher degree of confidentiality compared to court proceedings, which are usually public. This is beneficial for parties who wish to resolve their disputes discreetly, protecting their privacy and reputations.
5. **Cultural Sensitivity and Inclusivity.** Alternative conflict resolution methods can be more adaptable to different cultural contexts. They allow for the incorporation of cultural norms and practices, which can lead to more culturally appropriate and acceptable solutions. This inclusivity is essential in a globalized world where conflicts often involve parties from diverse cultural backgrounds.
6. **Empowerment and Participation.** Methods like mediation empower the parties involved by giving them a direct role in the resolution process. This active participation can lead to more satisfactory outcomes and greater adherence to the agreed-upon solutions, as parties feel ownership of the process and the results.
7. **Innovation and Adaptability.** Alternative conflict resolution methods encourage innovative and creative solutions that are not bound by rigid legal frameworks. This adaptability is crucial in addressing modern conflicts that may require unconventional solutions.
8. **Reduced Burden on Legal Systems.** By resolving conflicts outside the court system, alternative methods help reduce the burden on legal institutions. This can lead to faster resolution of cases that do require judicial intervention and improve the overall efficiency of the justice system.
9. **Better for Emotional and Psychological Well-being.** Engaging in adversarial legal battles can be emotionally and psychologically draining. Alternative methods, with their emphasis on collaboration and understanding, can be less stressful and more conducive to the well-being of the parties involved.
10. **Long-term Solutions.** Alternative conflict resolution methods often focus on addressing the underlying issues and interests of the parties, rather than just the immediate dispute. This can lead to more sustainable and long-term solutions, reducing the likelihood of future conflicts.

The importance of studying alternative conflict resolution methods lies in their ability to address the evolving and complex nature of modern conflicts. Their relevance is underscored by their potential to provide cost-effective, culturally sensitive, and sustainable solutions that preserve relationships, empower parties, and reduce the burden on legal systems. As conflicts continue to arise in various contexts, understanding and utilizing these methods can lead to more effective and harmonious resolutions.

As for the structure of the article, each section will include the following data:

The theoretical framework or literature review section of the article will provide an overview of relevant research and scholarly works on alternative methods of resolving disputes in the field of contract law. This section will provide a comprehensive review of existing literature and

theoretical frameworks related to alternative dispute resolution in contract law, setting the stage for the subsequent analysis and discussion in the article.

The methodology section of the article outlines the various scientific methods employed to study alternative ways of resolving disputes in the field of contract law. These methods collectively provide a comprehensive framework for analyzing alternative ways of resolving disputes in contract law. They facilitate the collection of empirical evidence, comparison of different methods, logical analysis of arguments, and forecasting of future trends, thereby contributing to a deeper understanding of the subject matter and formulation of meaningful conclusions.

The "Results and Discussion" section of the article presents findings and insights related to alternative dispute resolution (ADR) in contract law, as well as discussions on relevant regulations in different jurisdictions. Overall, the "Results and Discussion" section provides a comprehensive analysis of ADR methods and regulatory frameworks, offering insights into their application and implications for resolving contract disputes.

The "Conclusions" section of the article summarizes the key findings and implications of the study on alternative methods of resolving disputes in contract law. Regarding future research, it is suggested to explore the legal status and regulation of ADR in various jurisdictions, including EU legislation and international norms. This would further enhance understanding of ADR practices and their impact on contractual dispute resolution.

### **Theoretical Framework or Literature Review**

The analysis of alternative dispute resolution (ADR) methods in contract law reveals diverse perspectives and highlights several areas for debate and improvement. The researchers provide valuable insights into ADR's potential to enhance legal processes, but there are notable controversies and gaps that merit further exploration.

### **Key Studies and Critical Analysis**

Verba-Sydor, Vorobel, Grabar, Dutko, & Yurkevich (2021). This study emphasizes the flexibility and dispositional nature of ADR in Ukraine, arguing that these characteristics foster stronger partnerships and a peaceful resolution culture. While the benefits are well-noted, the

study could be critiqued for possibly overlooking challenges such as the lack of widespread public trust in ADR mechanisms and the potential for power imbalances between disputing parties. Additionally, there might be an overemphasis on theoretical advantages without sufficient empirical data on practical outcomes.

Baranova (2020). Baranova discusses the international acceptance of mediation, particularly in UN operations, and suggests that Ukraine's adoption of these methods aligns with EU harmonization strategies. However, this optimistic view might underplay the complexities of integrating international norms into domestic law, such as varying legal cultures and the potential resistance from traditional legal institutions. The study could benefit from a deeper examination of these integration challenges and the specific socio-political context of Ukraine.

Golubeva, Suleymanova, But, & Polunina (2023). This research highlights Ukraine's legislative advancements in mediation, noting the 2021 law and specific Civil Procedure Code provisions. While the legislative progress is commendable, the study could delve more into the practical implications and enforcement of these laws. There may be issues related to training qualified mediators, ensuring consistent application of mediation practices, and measuring the effectiveness of these new legal provisions.

Podkovenko (2018). Podkovenko's analysis of conciliation procedures amidst judicial reforms in Ukraine underscores the trend towards ADR. However, the broad assertion that ADR can universally reduce court burdens and resolve complex disputes might be overly simplistic. The study should address specific instances where ADR may not be suitable, such as highly adversarial or complex legal disputes that require formal judicial intervention.

Prylutska (2021). Prylutska's detailed exploration of various ADR forms in the US Federal Courts, including arbitration and mediation, offers a comparative perspective. The analysis is thorough but could benefit from a critical evaluation of the limitations and challenges each method faces. For instance, the study could investigate the potential for inconsistent outcomes in arbitration or the limited scope of enforceability in mediation agreements compared to court judgments.

### **Comparative Analysis and Debate**

Sharaya & Pankratova (2022). Their comparative analysis highlights the influence of European integration on ADR popularity in Ukraine. While they point out the benefits of reducing court burdens and achieving compromises, the study might be critiqued for not sufficiently addressing the variability in ADR acceptance and effectiveness across different regions and legal contexts in Europe. The assumption that European integration uniformly enhances ADR might overlook regional disparities and resistance.

Yanovytska (2019). Focusing on consumer disputes, Yanovytska acknowledges that mediation and arbitration are not universally effective for consumer protection. This realistic viewpoint is crucial, as it recognizes the potential limitations of ADR in achieving justice for consumers. The study could further explore the conditions under which ADR might fail to protect consumer rights adequately, such as in cases involving significant power imbalances between consumers and large corporations.

#### International Perspectives and Legal Frameworks

Islam (2021). Islam's exploration of ADR within the EU and international contexts underscores its growing importance. The study's strength lies in its comprehensive examination of ADR frameworks and their comparative analysis. However, it might benefit from a more critical stance on the implementation challenges and the potential discrepancies between ADR provisions and their practical enforcement. Additionally, the study could address the impact of cultural differences on ADR effectiveness.

Andrews (2023) & Carson (2023). Both authors highlight ADR's potential to preserve business relationships and provide flexible solutions. However, these benefits might be overstated without acknowledging the situations where ADR might fail to deliver equitable outcomes, such as in disputes with significant legal complexities or entrenched positions. The studies could also examine the potential downsides of ADR, such as the perceived lack of transparency and accountability compared to traditional litigation.

#### Areas for Improvement and Future Research

**Empirical Data and Practical Outcomes:** Many studies highlight the theoretical advantages of ADR but lack empirical data on its practical effectiveness. Future research should focus on

collecting and analyzing data from ADR cases to provide a clearer picture of its impact.

**Training and Qualification of Mediators:** Ensuring that mediators and arbitrators are adequately trained and qualified is crucial. Studies should explore the standards and practices for training ADR professionals and the mechanisms for maintaining high-quality mediation services.

**Public Trust and Awareness:** Building public trust in ADR mechanisms is essential for their success. Research should investigate public perceptions of ADR and develop strategies to enhance awareness and trust among potential users.

**Integration Challenges:** The integration of international ADR norms into domestic legal systems can be complex. Future research should address these challenges, including cultural differences, legal system compatibility, and institutional resistance.

**Power Imbalances:** ADR processes must address potential power imbalances between parties to ensure fair outcomes. Studies should explore mechanisms to mitigate these imbalances and protect the interests of weaker parties.

By addressing these areas, the field of ADR in contract law can advance towards more effective, equitable, and widely accepted dispute resolution methods.

#### Methodology

The study analyzed a sample consisting of 300 cases of contract disputes resolved through alternative dispute resolution (ADR) methods and traditional litigation. This sample size was chosen to provide a robust dataset that would allow for meaningful statistical analysis and generalizable conclusions.

#### Selection Criteria

**Diversity of Cases:** The cases were selected to cover a wide range of contract disputes, including commercial contracts, consumer agreements, employment contracts, and international trade disputes.

**ADR Methods:** The sample included various ADR methods such as mediation, arbitration, negotiation, and conciliation.

**Geographical Representation:** The study ensured representation from different regions within Ukraine, including urban and rural areas, to account for regional variations in ADR practice and effectiveness.

**Time Frame:** The cases were drawn from a five-year period (2016-2021) to capture recent trends and practices in ADR and litigation.

**Availability of Data:** Only cases with comprehensive data on the resolution process, costs, duration, and outcomes were included to ensure the reliability of the analysis.

#### Ensuring Representativeness

**Random Selection:** Cases were randomly selected from a larger database of contract disputes to minimize selection bias. This random sampling technique helps ensure that the sample is representative of the broader population of contract disputes.

**Stratified Sampling:** The sample was stratified based on the type of contract dispute and ADR method to ensure that each category was adequately represented. This approach ensures that the findings are not skewed by an overrepresentation of any particular type of dispute or resolution method.

**Data Validation:** The data was cross-validated with court records, ADR institution reports, and interviews with practitioners to ensure accuracy and completeness. This triangulation of data sources enhances the credibility of the findings.

#### Data Collection and Analysis

**Empirical Method:** Factual data was collected on each case, including the resolution method used, the time taken to resolve the dispute, the costs involved, and the satisfaction levels of the parties. This empirical data formed the basis for formulating and testing the hypothesis.

**Comparative Analysis:** The effectiveness of various ADR methods was compared against traditional litigation in terms of resolution time, cost, and party satisfaction. This method provided insights into the relative advantages and disadvantages of each dispute resolution method. **Logical Analysis:** Arguments for and against different ADR methods were analyzed using logical reasoning to identify their strengths and weaknesses. Inductive and deductive reasoning helped establish patterns and relationships between different aspects of dispute resolution.

**Conceptual Analysis:** Key concepts related to ADR, such as mediation, arbitration, and conciliation, were analyzed to clarify their meanings and implications in the context of contract law disputes.

**Forecasting Method:** Trends and potential future outcomes of ADR in contract law were projected based on current data and expert assessments, providing insights into the future landscape of dispute resolution.

The study's methodological rigor and comprehensive sample ensure that the findings are both reliable and applicable to the broader context of contract law disputes. By employing a mix of empirical data collection, comparative analysis, logical reasoning, and forecasting, the research provides a well-rounded examination of ADR methods and their effectiveness in resolving contract disputes.

#### Addressing Potential Biases

##### Selection Bias

**Random Selection:** To minimize selection bias, cases were randomly selected from a larger database of contract disputes. This approach ensured that no specific type of dispute or resolution method was overrepresented.

**Stratified Sampling:** The sample was stratified by dispute type and ADR method, ensuring proportional representation of different categories. This helped in accurately reflecting the diversity of contract disputes and resolution methods.

##### Confirmation Bias

**Blind Analysis:** Researchers conducting the analysis were not involved in the selection of cases. This blinding helped prevent researchers' expectations from influencing the analysis.

**Diverse Perspectives:** The research team included experts from various fields of law and ADR, ensuring that multiple viewpoints were considered and reducing the risk of individual biases affecting the results.

##### Data Source Bias

**Triangulation:** Data was collected from multiple sources, including court records, ADR institution reports, and interviews with practitioners. Triangulating data from different sources helped

ensure that the findings were not biased by any single source.

**Cross-Validation:** Data from ADR cases was cross-validated with official records and additional reports to confirm accuracy and completeness. This step ensured that the data used was reliable and free from inaccuracies.

#### Ensuring Validity and Reliability

##### Internal Validity

**Controlled Variables:** Key variables such as dispute type, resolution method, and outcomes (cost, time, satisfaction) were carefully controlled and consistently measured across all cases. This control helped isolate the impact of ADR methods on dispute resolution outcomes.

**Hypothesis Testing:** The hypothesis that "ADR methods, such as mediation, contribute to faster and more effective dispute resolution than the court system" was rigorously tested using empirical data. Statistical tests were used to determine the significance of the findings, enhancing internal validity.

##### External Validity

**Representative Sample:** By using random and stratified sampling techniques, the study ensured that the sample was representative of the broader population of contract disputes. This representativeness enhances the generalizability of the findings.

**Geographical and Temporal Scope:** The inclusion of cases from different regions and over a five-year period helped capture a wide range of practices and trends, making the findings more applicable to various contexts.

##### Reliability

**Standardized Data Collection:** A standardized data collection protocol was employed to ensure consistency in how data was gathered and recorded across all cases. This standardization is crucial for achieving reliable results.

**Repeat Analysis:** The analysis was repeated by different researchers to check for consistency in findings. Any discrepancies were resolved through discussion and re-analysis, ensuring that the results were robust and reproducible.

**Detailed Documentation:** All steps of the research process, from case selection to data

analysis, were meticulously documented. This documentation allows for replication of the study by other researchers, further ensuring reliability.

#### Mitigating Other Potential Biases

##### Observer Bias

**Independent Review:** An independent panel of experts reviewed the findings and methodology to ensure objectivity. This independent review helped mitigate observer bias by providing an external check on the research process and conclusions.

**Feedback Mechanism:** Feedback was sought from practitioners and participants in ADR processes to validate the findings and provide practical insights. This engagement with stakeholders helped refine the conclusions and address any unnoticed biases.

##### Response Bias

**Anonymous Surveys:** When collecting satisfaction data from parties involved in disputes, surveys were conducted anonymously to encourage honest and unbiased responses. This anonymity helped reduce response bias and provided more accurate measures of party satisfaction.

**Balanced Questionnaire:** The survey instrument was carefully designed to avoid leading questions and ensure a balanced assessment of ADR and litigation experiences.

By addressing these potential biases and implementing measures to ensure validity and reliability, the study provides a robust and credible analysis of the effectiveness of alternative dispute resolution methods in contract law.

## Results and Discussion

Alternative dispute resolution (hereinafter ADR) is a group of processes by which disputes and conflicts are resolved without recourse to the formal judicial system (Smithcurrie, 2017).

Carson (2023) outlines the following steps for dispute resolution in contract law.

- 1) **Review your contract.** The obvious starting point for any contract dispute is the contract itself. A legally enforceable contract must be in place before any dispute can arise in relation to it (albeit there may be a dispute about whether a contract exists at all). In an

ideal world, your contract will be in written form and signed by all parties. If the contract arose orally, through correspondence or by conduct, the relevant material must be carefully scrutinised to ascertain whether it amounts to an enforceable contract and, if so, its terms. A well-drafted contract should enable you to identify which clause applies to the conduct in question and ascertain whether that conduct amounted to a breach. It should also provide information to help you determine how serious any breach is. The remedies available in a contract dispute vary depending on the type of clause breached and the effects of the breach. If the breach is of a key term, the remedies available may include termination and damages, whilst a breach of a less fundamental term may give rise only to a claim for damages. The information to look out for includes the following: Which country's law governs the contract? (Contracts sometimes have a 'jurisdiction' clause, which states which country's laws apply to the agreement and which Courts have the power to decide any dispute arising from it). Does the contract contain a non-binding Alternative Dispute Resolution (ADR) clause? (This type of clause details any non-binding ADR methods that the parties must attempt before litigation. Common types of ADR include negotiation and mediation). Does the contract contain a binding Dispute Resolution (DR) clause? (Contracts can contain a DR clause specifying the method that must be used to resolve a dispute. DR methods result in binding decisions that the parties must adhere to (subject to any appeals process). Court proceedings are the most well-known form of DR, but others include arbitration and expert determination.) Is there an escalation clause? (Some contracts contain an 'escalation clause' detailing the 'escalation' procedure applicable to disputes. These clauses set out a series of steps that the parties must follow before they resort to the ultimate dispute resolution method, often litigation or arbitration).

- 2) Consider the evidence.
- 3) Consider alternatives to litigation.

The primary methods of alternative dispute resolution (ADR) commonly used are as follows:

1. Negotiation: Parties or their representatives openly discuss their issues to reach a resolution. Successful negotiations are cost-

effective, quick, and can preserve ongoing commercial relationships.

2. Mediation: A neutral third party, known as the Mediator, assists parties in reaching a mutually agreeable settlement.
3. Early Neutral Evaluation (ENE): Parties seek a neutral third-party opinion regarding the merits of their positions. ENE doesn't result in a resolution but serves as a starting point for negotiations.
4. Binding Methods of Dispute Resolution: If parties cannot settle the matter themselves, they resort to more formal, binding methods. These include:
  - Arbitration: An arbitrator decides the case, with limited avenues for appeal. It's less formal than litigation and allows parties more control over the process. Arbitration rights must be outlined in the contract.
  - Expert Determination: Parties appoint an impartial expert to make a binding decision, unless otherwise agreed.
  - Adjudication: Applied to construction industry disputes, an adjudicator's decision is usually binding unless appealed through arbitration. It offers quick clarity without halting construction projects.

Let's consider the regulation of alternative dispute resolution under the laws of different countries.

The Cross-Border Mediation Regulation (EU Directive) establishes the rules for mediation in civil and commercial cases with an international element within the European Union, the principles of mediation (voluntariness, neutrality, confidentiality, and autonomy of the parties), support and facilitation, stimulate cooperation between EU member states in the field of mediation and interaction with other international organizations engaged in mediation, contain requirements for the appointment and registration of mediators, ensuring compliance of their qualifications and competence with EU standards, as well as regulating the implementation of agreements concluded within the framework of mediation, and determining the conditions for recognition and implementation of such agreements in other EU member states. These key provisions are aimed at creating a unified and effective system of mediation in international disputes within the European Union, contributing to the resolution of conflicts and maintaining justice and legality (Legislation web-site, 2011)

Key provisions of Regulation (EC) 524/2013 (European Union, 2013) on online dispute resolution for consumer disputes and amending Regulation (EC) No. 2006/2004 and Directive 2009/22/EC include the following:

1. Scope: The Regulation concerns the online resolution of disputes between consumers and businesses in the European Union via the Internet.
2. Creation of a platform for online dispute resolution (ODR): The Regulation provides for the creation of an ODR, which provides consumers and businesses with the opportunity to turn to a neutral mediator for online dispute resolution.
3. Support of the relevant authorities: The Regulation requires that each EU Member State provides access to the ODR and provides information about the online dispute resolution procedure.
4. Transparency and confidentiality: The Regulation establishes principles of transparency and confidentiality to ensure fair and safe dispute resolution.
5. Responsibility for the implementation of decisions: The Regulation defines the responsibility of the parties for the implementation of decisions made in the framework of online dispute resolution.
6. Information support: The Regulation provides for the provision of relevant information to consumers and businesses regarding their rights and obligations in the context of online dispute resolution.

These key provisions aim to facilitate access to fair and effective online dispute resolution, in particular in the field of consumer relations, and contribute to increasing trust in e-commerce in the European Union.

England and Wales and Northern Ireland by the Arbitration Act (Legislation, 1996) sets out rules for arbitration procedures in England and Wales and Northern Ireland, regulating the resolution of disputes outside of court. The law ensures the recognition and enforcement of arbitral awards, establishes procedures for the enforcement of such awards in courts, guarantees the independence of arbitrators and prohibits any impermissible interference in the arbitration process, establishes rules for the appointment of arbitrators, the conduct of the arbitration process and the presentation of evidence. The law provides for limited judicial review of arbitral awards, establishing the grounds for setting aside or invalidating such awards and establishing restrictions on the resolution of certain categories

of disputes by arbitration, for example, in cases where it is contrary to public policy. The Scotland by the Arbitration Act (Legislation, 2010) also sets out rules for arbitration procedures in Scotland, regulating the resolution of disputes outside of court.

The main provisions of the Convention on the Recognition and Enforcement of Foreign Arbitral Awards (New York Convention) include the following:

- Recognition and enforcement: The Convention requires each party to the treaty to recognize and enforce arbitral awards that have been made in another state party.
- Conditions for recognition and enforcement: The Convention establishes specific conditions under which an arbitral award can be recognized and enforced, such as the existence of a written agreement between the parties and the absence of a violation of public order.
- Restrictions on the intervention of national courts: The Convention limits the intervention of national courts in the process of recognition and enforcement of foreign arbitral awards, ensuring the prompt and effective execution of such awards.
- Arbitral awards subject to recognition: The Convention applies to arbitral awards that are rendered outside the state where the award is recognized and enforced and relates to civil or commercial matters.
- Procedures for recognition and enforcement: The Convention sets out procedures for the recognition and enforcement of foreign arbitral awards, including procedures relating to the submission of applications, the presentation of evidence, and the delivery of judgment by the court.
- Ensuring wide application: The Convention is aimed at ensuring the wide application of the arbitration process as an effective means of resolving international commercial disputes (The Convention on the Recognition and Enforcement of Foreign Arbitral Awards (the New York Convention)).

Ukrainian legislation also regulates the issue of alternative dispute resolution (Law No. 1701-IV, 2004).

Alternative dispute resolution for consumers (European Commission, 2023) regulates the following:

- **Obligation to provide information:** Service providers must provide consumers with information about the availability of alternative dispute resolution (ADR), including mediation and arbitration.
- **Creating accessible and effective mechanisms:** Ensuring the accessibility and effectiveness of ABC procedures for consumers by developing simple and understandable procedures that would be available in online and offline formats.
- **Awareness raising:** Conducting information campaigns to raise consumer awareness of the benefits of using alternative dispute resolution methods and the procedures available to them.
- **Ensuring independence and security:** Ensuring the independence and security of ABC procedures, in particular by ensuring confidentiality, non-disclosure of information, and protection from the influence of one of the parties.
- **Ensuring accessibility for all:** Ensuring accessibility of ABC procedures for all categories of consumers, including people with disabilities and those with limited access to the Internet or other resources.
- **Promoting Voluntary Dispute Resolution:** Promoting voluntary dispute resolution by creating an environment conducive to negotiation and mediation where parties can reach a mutually agreeable settlement.
- **Monitoring and evaluation:** Monitoring and evaluation of the effectiveness of ABC procedures to ensure their compliance with the requirements and needs of consumers.

These provisions are aimed at ensuring effective and fair resolution of disputes between consumers and service providers in the European Union.

Regarding the UK, the withdrawal of Great Britain from the EU (Brexit) has led to changes in the legislation regarding confidentiality, enforcement, and limitation periods in the field of mediation. The UK government has proposed legislation to repeal the 2011 Regulation implementing the EU Mediation Directive. The Cross-Border Mediation Regulation (EU Directive) 2019 was adopted on 1 March 2019 and entered into force on 1 January 2021. Article 69 of the Withdrawal Agreement sets out the conditions under which EU law applies in the case of ongoing procedures, including mediation. As of January 1, 2021, the 2011 Regulation and related amendments to the Civil Procedure Regulation were repealed. Consequently, the provisions of the EU Mediation Directive

(regarding confidentiality, enforcement, and restrictions) no longer apply to cross-border mediations held in the UK. The only exception is when the court offers or orders the parties to use mediation before the end of the transition period, or when the parties agree to mediation (Law society, 2021).

The Commission Recommendation of April 4, 2001, defines the main principles of ABC. In particular:

- 1) Ensuring a high standard of good faith, independence, impartiality and transparency of non-judicial bodies engaged in the settlement of disputes between consumers and enterprises.
- 2) Involvement in the dispute resolution process of effective, objective and neutral third parties or bodies that ensure high quality services and help to reach a settlement based on the agreement of the parties.
- 3) Ensuring accessibility and simplicity of procedures for consumers who use extrajudicial bodies to resolve their disputes.
- 4) Preventing conflicts of interest and ensuring objective consideration of cases, including protection of consumer rights.
- 5) Promoting the widespread use of out-of-court dispute resolution mechanisms and supporting the development of these mechanisms in the European Economic Area.

These principles are aimed at creating an effective and fair system for resolving disputes between consumers and businesses, which would contribute to ensuring trust and protecting the interests of all parties (Euro-Lex, 2001).

Although arbitration and mediation are forms of alternative dispute resolution (ADR), they have different characteristics. The arbitration is governed by the Maltese Arbitration Act, which brings together a number of internationally applicable rules. Arbitration is usually used in commercial disputes because it is more flexible and cost-effective. Arbitration involves the appointment of a third party, called an arbitrator, who makes a decision based on the evidence presented by the parties. Mediation, on the other hand, is more commonly used in civil cases, including divorce. For example, mediation is mandatory in divorce cases and is considered part of the divorce process. In Malta, mediation is used as a way to reach an agreement between the parties without making any decisions. In Malta, there are several tribunals and councils designed

to facilitate the resolution of disputes. Under these schemes, consumers can turn to organizations such as:

- Department for Consumer Affairs as part of the Department for Consumer Affairs and Competition,
- Malta Financial Services Authority.

There are also Small Claims Tribunals and Consumer Complaints Tribunals that specialize in resolving certain types of disputes (Lawyers Malta eu, 2023).

We will conduct a comparative analysis of alternative dispute resolution further (Table 1).

**Table 1.**

*Comparative characteristics of alternative dispute resolution methods in contract law.*

	<b>Private negotiations</b>	<b>Mediation</b>	<b>Judicial proceedings</b>
<b>Ground</b>	Agreement on negotiations	Agreement and agreement on participation in mediation	Lawsuit
<b>Nature</b>	Equality of participants	Participation on a parity basis	Competitive process
<b>Beginning</b>	One party contacts the other on its own initiative	At the request of a party, the mediator may contact the other party	Notification of preliminary consideration of the case through the court
<b>Difficulties</b>	Absence of a person who manages the process It can be different.	Convince the other party to start the procedure	Clarification of the essence of the dispute; implementation of the decision
<b>Duration</b>	Negotiations may be delayed due to lack of organization of the process	It is evaluated by the parties in advance. Voluntary participation sets the parties to resolve the dispute as soon as possible	Assigning a case to consideration takes a lot of time. The other party may not appear in court, court hearings will be postponed.
<b>The degree of control of the parties over the result and the process</b>	High	High	Low
<b>Regulation</b>	Informal procedure	Rules of mediation and Code of ethics of a mediator	Procedural legislation
<b>The role of lawyers</b>	Ensuring that the process is cooperative or adversarial depending on the type of negotiation in which they are participating	Ensuring cooperation. Effectively contribute to negotiations conducted with the help of a third neutral party. Legal registration of mediation results	Ensuring competitiveness of the process during protection
<b>The role of a neutral third party</b>	The role of mediator in negotiations	Mediation in negotiations and establishment of communication (mediator)	Making a decision based on the law (judge)
<b>Risks</b>	Lack of consent or formal consent	Lack of consent	Unpredictable result and difficulty in implementing the decision
<b>Procedure for formalizing the result</b>	Agreement or contract	An arrangement, agreement or contract	Court order or decision
<b>Relations between the parties</b>	They remain undefined	Improved	Can deteriorate and be torn

In the field of contract law, there are some problems related to the use of alternative methods of dispute resolution. Among them, we will single out the following:

1. Lack of awareness: Many participants in contractual relations may not be fully aware of the possibility of using ABC to resolve disputes. This may lead to an underestimation of the importance of these

methods and an incorrect choice of procedure.

2. **Lack of legitimacy:** Some participants may perceive AVC as less legitimate or less effective as a method of dispute resolution compared to the judicial process. This can lead to distrust of the results or unsuccessful attempts to use ABC.
3. **Inequality of actors:** In complex cases or between actors with unequal resources, there may be inequality in the impact and opportunities to use ABC. This can lead to unequal conditions for participation in the procedure and unfair resolution of the dispute.

In our opinion, solutions to these problems may include:

- **Information campaign:** Conducting information campaigns to increase the awareness of participants in contractual relations about the advantages and opportunities of ABC.
- **Increasing legitimacy:** Strengthening the legitimacy and trust of ABC through the creation of quality standards, certification of professionals and educational activities.
- **Ensuring equality:** Implementation of measures to ensure the equality of participants in the ABC process, including access to free or subsidized legal aid and protection of the rights of less well-off parties.
- **Encouraging the use of AVC:** Encouraging the use of AVC by including mandatory clauses in contracts to resolve disputes using these methods and providing incentives for their use, such as reduced costs or speeding up the procedure.

The study of alternative dispute resolution (ADR) in the context of contract law reveals significant theoretical and practical implications, particularly when related to previous studies and broader legal frameworks.

#### Theoretical Implications

##### ADR as a Complementary System:

The concept of ADR is theoretically grounded in the notion that formal judicial systems are not always the most efficient or effective means for resolving disputes. ADR processes like mediation, arbitration, and negotiation are designed to provide more flexible, cost-effective, and timely solutions. The theory posits that these methods preserve relationships and

confidentiality better than traditional litigation. This aligns with the works of Fisher & Ury (1981), who introduced the idea of "principled negotiation" in their book "Getting to Yes," advocating for methods that allow for mutual gain.

##### Contractual Autonomy and ADR:

The steps outlined by Carson (2023) emphasize the importance of reviewing contract clauses related to ADR. This highlights the theoretical underpinning of contractual autonomy, where parties have the freedom to determine their dispute resolution mechanisms. This aligns with classical contract theory, which posits that parties enter into agreements with the expectation that their terms will be honored, including those pertaining to dispute resolution.

##### Practical Implications

##### Efficiency and Cost-Effectiveness:

ADR methods such as mediation and arbitration are praised for their efficiency and cost-effectiveness. Practical evidence from commercial sectors shows that ADR can significantly reduce the time and costs associated with dispute resolution. For instance, a study by the American Arbitration Association (2016) found that arbitration can resolve disputes more quickly than litigation, with parties often spending less on legal fees and other associated costs.

##### International Regulation and Enforcement:

The European Union's Cross-Border Mediation Regulation and the New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards are practical frameworks that facilitate the international application of ADR. These regulations ensure that ADR outcomes are enforceable across borders, enhancing their reliability and effectiveness. The practical implication here is the increased certainty for parties engaging in cross-border transactions, knowing that their dispute resolution mechanisms will be respected internationally.

##### Legitimacy and Trust in ADR:

Despite its benefits, ADR faces challenges regarding legitimacy and trust, particularly in less formal settings. Carson (2023) highlights concerns about the perceived effectiveness of ADR compared to judicial proceedings. This perception issue is addressed in the EU's efforts

to standardize mediation practices and ensure the competence of mediators, as seen in the Cross-Border Mediation Regulation. Strengthening these aspects can enhance the legitimacy and trust in ADR processes.

#### Comparative Analysis with Previous Studies

##### Differences in ADR Practices Across Jurisdictions:

The comparison between different jurisdictions, such as the EU's comprehensive ADR framework and the UK's post-Brexit legislative changes, reveals varied approaches to ADR. Previous studies, such as those by Menkel-Meadow (2009), have noted that cultural and legal traditions significantly impact the adoption and success of ADR methods. The EU's structured approach contrasts with the more ad-hoc developments seen in other regions, such as the UK's evolving stance post-Brexit.

##### Impact on Commercial Relationships:

Studies have shown that ADR, particularly mediation and negotiation, can preserve commercial relationships better than litigation. The focus on mutually agreeable solutions helps maintain business partnerships. This is supported by practical findings from sectors like construction, where adjudication is used to resolve disputes swiftly without halting projects, as noted in Carson (2023).

##### Relevance to the Field

##### Integration of ADR in Contract Drafting:

The practical guidance provided by Carson (2023) underscores the importance of integrating ADR clauses in contract drafting. This reflects a growing trend in legal practice where lawyers proactively include ADR mechanisms to preemptively address potential disputes. This trend is supported by the increasing use of escalation clauses and mandatory mediation or arbitration clauses in commercial contracts.

##### Promoting ADR Awareness and Accessibility:

The theoretical and practical challenges identified, such as lack of awareness and inequality of resources, suggest a need for greater promotion and accessibility of ADR. Initiatives like information campaigns and legal aid for ADR can address these issues. The EU's efforts in promoting ADR through transparency and

support frameworks serve as a model for other jurisdictions.

The findings on ADR in contract law emphasize its role as a viable alternative to traditional litigation, offering efficiency, cost-effectiveness, and the potential to preserve business relationships. Theoretical insights align with the principles of contractual autonomy and the benefits of less adversarial dispute resolution methods. Practically, the integration of ADR in contract drafting and international frameworks like the New York Convention ensure its applicability and enforceability across borders. Addressing challenges related to legitimacy, trust, and awareness will further solidify ADR's relevance and utility in the legal field.

#### Conclusions

The study provides several original contributions to the field of contract law, which have significant relevance to both legal practice and future research. These contributions underscore the evolving nature of dispute resolution and offer practical guidance for legal practitioners, policymakers, and scholars.

##### Original Contributions to the Field of Contract Law.

##### 1. Comprehensive Framework for ADR Clauses:

The study by Carson (2023) offers a detailed framework for analyzing and drafting ADR clauses within contracts. By emphasizing the importance of reviewing the contract, considering evidence, and exploring alternatives to litigation, this framework provides a structured approach that legal practitioners can apply directly in their practice. This contribution is particularly relevant in helping lawyers to craft robust ADR clauses that can preemptively address potential disputes.

##### 2. Comparative Analysis of ADR Methods:

The study's comparative analysis of ADR methods, including negotiation, mediation, arbitration, early neutral evaluation, expert determination, and adjudication, provides a nuanced understanding of their respective advantages and limitations. This analysis is original in its systematic comparison, helping practitioners choose the most suitable ADR method for specific types of contract disputes. It also highlights the importance of understanding

the context and nature of disputes, which is critical for effective dispute resolution.

#### 4. Insight into International Regulatory Frameworks:

The exploration of international regulations, such as the Cross-Border Mediation Regulation (EU Directive), Regulation (EC) 524/2013 on online dispute resolution, the Arbitration Acts in the UK, and the New York Convention, offers valuable insights into how different jurisdictions handle ADR. This is a significant contribution, providing a comparative legal perspective that is essential for practitioners dealing with cross-border contracts. It also sets a foundation for future research on the harmonization of ADR practices globally.

#### 5. Addressing Practical Challenges in ADR:

The study identifies key challenges in the practical application of ADR, such as lack of awareness, perceived legitimacy issues, and inequality among parties. By proposing solutions like information campaigns, strengthening legitimacy through quality standards, and ensuring equality through legal aid, the study offers actionable recommendations. These contributions are highly relevant for policymakers and institutions aiming to promote the use of ADR and ensure its fair application.

##### Relevance to Practice

##### Enhancing Contract Drafting Practices:

The practical guidance on integrating ADR clauses into contracts is directly applicable to legal practice. Lawyers can use this framework to draft more effective contracts that anticipate and manage potential disputes through ADR, thereby reducing the likelihood of costly and protracted litigation.

##### Improving Dispute Resolution Efficiency:

The detailed comparison of ADR methods equips practitioners with the knowledge to select the most appropriate dispute resolution mechanism, tailored to the specific needs of their clients and the nature of the dispute. This can lead to more efficient and satisfactory outcomes for all parties involved.

##### Supporting Cross-Border Transactions:

The insights into international regulatory frameworks are particularly valuable for

practitioners involved in cross-border transactions. Understanding the nuances of different legal systems and ADR practices can help lawyers better advise their clients and navigate the complexities of international dispute resolution.

##### Relevance to Future Research

##### Harmonization of ADR Practices:

The study lays the groundwork for future research on the harmonization of ADR practices across different jurisdictions. Researchers can build on this work to explore how international frameworks can be further aligned to facilitate more seamless cross-border dispute resolution.

##### Impact of ADR on Contractual Relationships:

Future research can investigate the long-term impacts of different ADR methods on contractual relationships. This could include empirical studies examining how ADR affects the longevity and quality of business relationships compared to traditional litigation.

##### Evolving Legal Standards and Practices:

The study's identification of challenges and proposed solutions provides a basis for future research on the evolving standards and practices in ADR. Researchers can explore how these solutions are implemented in practice and their effectiveness in addressing the identified challenges.

The study's original contributions to the field of contract law are significant, offering a comprehensive framework for ADR, a comparative analysis of methods, insights into international regulations, and practical solutions to challenges. These contributions are highly relevant to legal practice, providing practical tools and guidance for practitioners. They also open new avenues for future research, particularly in the harmonization of ADR practices and the long-term impacts of ADR on contractual relationships. By addressing both theoretical and practical aspects of ADR, the study enriches the field of contract law and underscores the importance of effective dispute resolution mechanisms in modern legal practice.

##### Recommendations for Future Research

#### 1. Empirical Analysis of ADR Effectiveness:

Future research should focus on conducting empirical studies to assess the effectiveness of various ADR methods in resolving contract disputes. This could involve gathering data on resolution times, costs, satisfaction levels, and long-term outcomes for different ADR processes such as negotiation, mediation, arbitration, and expert determination.

## 2. Impact of ADR on Contractual Relationships:

Investigate the long-term effects of ADR on the quality and durability of contractual relationships. This research could examine whether the use of ADR contributes to more amicable and sustainable business relationships compared to traditional litigation, and how different methods of ADR affect these relationships differently.

## 3. Harmonization of International ADR Practices:

Explore the potential for harmonizing ADR practices across different jurisdictions. This could involve comparative studies of ADR frameworks in various countries, identifying best practices, and proposing models for international cooperation and standardization. Particular focus could be on the feasibility and impact of creating unified standards for cross-border ADR processes.

## 4. Technological Advancements in ADR:

Examine the role of technology in enhancing ADR processes, particularly with the rise of online dispute resolution (ODR) platforms. Future research could assess how digital tools and artificial intelligence can improve the efficiency, accessibility, and fairness of ADR, and what challenges might arise in implementing these technologies.

## 5. ADR in Specific Industries:

Conduct sector-specific studies to understand the unique challenges and benefits of ADR in different industries. For example, research could focus on ADR in construction, finance, healthcare, or technology sectors, exploring how industry-specific regulations and practices influence the effectiveness of ADR.

## 6. Legal and Cultural Barriers to ADR Adoption:

Investigate the legal and cultural barriers that hinder the widespread adoption of ADR. This research could identify specific legal impediments, such as restrictive regulations or lack of enforcement mechanisms, as well as cultural factors that affect parties' willingness to engage in ADR, particularly in different geographic regions.

## 7. Role of Legal Professionals in ADR:

Explore the evolving role of legal professionals in ADR processes. This could involve studying how lawyers, mediators, and arbitrators contribute to the success of ADR, what skills and training are necessary for effective participation, and how the legal profession is adapting to the increasing use of ADR.

## 8. Evaluating the Effectiveness of ADR Awareness Campaigns:

Assess the impact of information campaigns designed to raise awareness about ADR. Future research could evaluate the effectiveness of these campaigns in increasing knowledge and utilization of ADR among potential users, and identify best practices for designing and implementing such initiatives.

## 9. Addressing Power Imbalances in ADR:

Research strategies to address and mitigate power imbalances in ADR processes. This could involve developing and testing interventions that ensure fair participation for all parties, particularly in cases involving significant disparities in resources or influence.

## 10. Regulatory Frameworks and ADR Legitimacy:

Study how different regulatory frameworks influence the perceived legitimacy and trust in ADR processes. This could involve comparative analyses of regulatory environments in various jurisdictions, examining how legal structures, certification standards, and enforcement mechanisms affect the credibility and acceptance of ADR.

By addressing these areas, future research can contribute to a deeper understanding of ADR's role in contract law, enhance its effectiveness, and promote its wider adoption across different contexts and jurisdictions.

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## The debate on the interaction of authorized units in the investigation of transnational crimes: a critical review

### Наукова полеміка стосовно взаємодії уповноважених підрозділів під час розслідування транснаціональних злочинів: критичний огляд

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#### Abstract

The article is devoted to the study of the essence of interaction between authorized entities in the investigation of criminal offenses committed by transnational organized criminal groups. The authors focus on the fact that this type of cooperation has always caused scientific discussions and practical differences. The methodological basis for the research is a set of general and specific methods and techniques of scientific knowledge: dialectical, monographic, logical and semantic, structural and functional, grouping, formal and legal documentary analysis, system and structural, modelling. It is stated that all scholars defined interaction in view of the existing system of law enforcement agencies and their inherent functions. At the same time, the subject of interaction is always specific, and full interaction occurs when the subject with managerial authority treats the hierarchically subordinate entity as a complete entity without

#### Анотація

Стаття присвячена дослідженню сутності взаємодії уповноважених суб'єктів при розслідуванні кримінальних правопорушень, вчинених транснаціональними організованими злочинними групами. Автори акцентують увагу на тому, що цей вид співпраці завжди викликав наукові дискусії та практичні розбіжності. Методологічною основою дослідження є сукупність загальних і специфічних методів і прийомів наукового пізнання: діалектичного, монографічного, логіко-семантичного, структурно-функціонального, групування, формально-правового, документального аналізу, системно-структурного, моделювання. Встановлено, що всі вчені визначали взаємодію з огляду на існуючу систему правоохоронних органів та притаманні їм функції. При цьому суб'єкт взаємодії завжди специфічний, а повноцінна взаємодія можлива

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ignoring its subjective features in the process of their common activity. The importance of cooperation between international law enforcement and police organizations, for coordinating efforts to combat crimes of a transnational nature was highlighted. The authors' concept of law enforcement cooperation during the investigation of crimes committed by transnational organized criminal groups is presented.

**Keywords:** transnational organized criminal group, criminal offenses, interaction, law enforcement agencies, investigation, investigative (search) actions, planning.

## Introduction

Investigating crimes committed by transnational organized groups is a very complex process in many aspects. In particular, this activity is multi-stage in the procedural sense, diverse in the technical, methodical and tactical aspects. Accordingly, there is often a need to combine the efforts of several officials, divisions, bodies, and departments to achieve a common goal – ensuring quick, objective, comprehensive, effective and impartial investigation of such crimes. In addition, the necessity is determined by the complexity of the mechanism of such offenses.

The main task of the interaction of authorized subdivisions when investigating crimes committed by transnational organized groups is to prosecute those offenses, bring the perpetrators to justice, compensate for the damage caused by such offenses, and restore the violated rights and interests of citizens and legal entities.

The interaction between various law enforcement agencies has always caused scientific discussions and practical differences in connection with different understandings of the need to use the specified category. In fact, if for some entities cooperation is sufficiently relevant in their activity, then for others it is sometimes an unnecessary burden. At the same time, it should be noted that the commission of criminal offenses by transnational organized criminal groups cannot be effectively investigated without the participation of various units both in Ukraine

лише тоді, коли суб'єкт, що володіє управлінськими повноваженнями, ставиться до ієрархічно підлеглого суб'єкта як до цілісного, не ігноруючи його суб'єктивних особливостей у процесі спільної діяльності. Було підкреслено важливість співпраці між міжнародними правоохоронними та поліцейськими організаціями для координації зусиль у боротьбі зі злочинністю транснаціонального характеру. Представлено авторську концепцію взаємодії правоохоронних органів під час розслідування злочинів, вчинених транснаціональними організованими злочинними групами.

**Ключові слова:** транснаціональне організоване злочинне угруповання, кримінальні правопорушення, взаємодія, правоохоронні органи, розслідування, слідчі (розшукові) дії, планування.

and abroad. In view of the above, there was an urgent need to investigate the above issues.

At the same time, it is worth noting that interaction is one of the main prerequisites for ensuring any activity, and especially for the realization of criminal proceedings of each category, as it is logically constructed and aimed at achieving common objectives that will most effectively implement relevant procedural actions into reality, as well as ensure the optimal result of the investigation.

Besides, the commission of criminal offenses by transnational organized criminal groups cannot be effectively investigated without the participation of various units both in Ukraine and abroad. This is explained by the fact that certain illegal acts are committed in different states near, as well as far abroad. In the context of the above, in our opinion, there is also a need to involve interstate law enforcement organizations (Interpol, Europol) in cooperation.

Consequently, the purpose of this article is to determine the essence of the interaction of authorized units during the investigation of crimes committed by transnational organized criminal groups.

To achieve this goal, we considered the approaches to the concept of interaction between authorized agencies in the investigation of offences in general and organized crime in particular provided by foreign and domestic scholars. We also examined how this issue is

regulated in relevant Ukrainian legal instruments. Besides, we allocated the forms, principles and levels of cooperation of law enforcement agencies in the field of combating organized crime. The importance of cooperation between international law enforcement and police organizations, for example, Interpol and Europol, for coordinating efforts to combat crimes of a transnational nature was highlighted. As a result, we presented our own concept of law enforcement cooperation during the investigation of crimes committed by transnational organized criminal groups.

### Methodology

The methodological basis for the research is a set of general and specific methods and techniques of scientific knowledge. In particular, dialectical method was used to examine the essence of interaction in general.

Monographic method was applied for the study of the works by the domestic and foreign scholars, who investigated the issue under consideration.

The application of logical and semantic method helped to examine the following forms of interaction: between the investigative and operational units; between pre-trial investigation bodies and operational units.

The structural and functional method made it possible to find out the main types of interaction in the practice of preventing criminal offenses by relevant law enforcement agencies.

With the help of grouping method, the features of modern organized crime were revealed.

The formal and legal documentary analysis method was helpful in highlighting the importance of international law enforcement and police organizations for coordinating efforts to combat crimes of a transnational nature as well as in approving the fact that the interaction of the National Police of Ukraine with international organizations takes place at the global and regional levels.

Application of the system and structural method was useful for schematic construction of the channel of passing information or carrying out interaction between the law enforcement body of Ukraine and the relevant agency of the other State.

The modeling method allowed to develop the author's definition of the concept of law enforcement cooperation during the investigation of crimes committed by transnational organized criminal groups.

### Literature Review

Many scientific works are devoted to various aspects of cooperation in the fight against crimes committed by transnational organized groups. In particular, the research "The theory and practice of combating transnational organized crime in Ukraine" by Zharovska (2019, p. 23) deserves special attention. The author states that international cooperation as a necessary element of systemic control over transnational organized crime can be implemented both informally (exchange of information, technical assistance) and officially in the forms facilitating the extradition of criminals and mutual legal assistance at various stages of the investigation. Complex use of informal methods of interaction combined with official ones is important for overcoming difficulties and misunderstandings, as well as preventing delays in the process of controlling transnational organized crime.

In the view of Zavydniak (2021) cooperation in the investigation of transnational crimes, as well as cooperation in the investigation of general criminal crimes committed on the territory of Ukraine, from the point of view of Ukrainian legal doctrine, is carried out in the form of information exchange, namely, by sending requests for legal assistance, extradition, for taking over criminal proceedings, the creation of joint investigative teams or the presence of representatives of competent bodies of foreign States during procedural actions and by sending a request for the temporary transfer of a person.

According to Chorny et al. (2021) joint counteraction against international crime by all law enforcement agencies of different countries brings common results in eradicating this phenomenon in the world and reducing the number of crimes in a single state. This is one of the most relevant areas of international cooperation worldwide.

Kolomiets and Yushchenko (2024) turned to the criminal procedural legislation of Germany, Spain, the UK and France to study the main aspects of the pre-trial investigation and inquiry in these countries. The authors established, how criminal proceedings are initiated, as well as the way prosecutors and police officers cooperate. They also found out that the success of the pre-

trial investigation in foreign countries is facilitated by a clear organizational structure of criminal justice bodies in a complex with a well-established interaction of prosecutors with judicial investigators, the court and the police.

According to Kevin Carty – Senior Police Advisor to the OSCE Secretary General, if the fight against organized crime is to be successful, then it is essential that the different elements of the criminal justice system work cohesively together. Lack of co-ordination militates against the overall effectiveness of the system and only serves the interest of the criminal. It is also important to remember that the investigation of organized crime requires a multi-agency approach with the support of civil society (OSCE, 2007).

Professor of Criminal Law of the University of Queensland Andreas Schloenhardt, Professor of Criminal Law, University of Queensland stresses on the importance of comprehensive, efficient, effective, multi-agency and flexible international cooperation to ensure the appropriate investigation and prosecution of transnational organized crime. Such interaction is grounded on the treaties between States) to cooperate for achieving a common goal. It takes place when countries share data or evidence, interact to bring perpetrators to justice and join assets and human resources, including officials of law enforcement agencies to fight transnational organized crime (UNODC, 2021).

Shelly (2018) states that involvement of various international organizations significantly strengthens the fight against transnational organized crime, as these entities play a pivotal role in facilitating cooperation among nations, developing legal frameworks, and providing resources and expertise in the battle against these global crimes.

Having conducted the relevant research, Dulskiy et al. (2023) come to the conclusion that direct interaction between the competent bodies of the States contributes to increasing the efficiency of cooperation in the investigation of organized crime, as well as simplifies the solution of a number of organizational issues.

In the view by Zakir et al. (2024), a multifaceted approach involving enhancing international legal frameworks, improving cooperation among nations, and adopting innovative strategies is required for addressing transnational organized crime. This method includes: strengthening international legal instruments, harmonizing

national laws, enhanced international cooperation, capacity building and resource sharing, utilizing technology for law enforcement, public-private partnerships, strengthening judicial cooperation, protecting human rights, targeting crime proceeds, global governance and policy coordination.

The study of the problem under consideration is also impossible without the study and analysis of the provisions of international treaties and rules of procedural legislation.

The importance of international cooperation during the investigation of transnational organized crime is emphasized in the UN Convention against Transnational Organized Crime (UN General Assembly, 2000). In particular, the Convention defines the concept of mutual legal assistance as the provision of the widest possible assistance by States Parties upon request in the investigation, prosecution and trial of crimes defined by the Convention, which is carried out on a mutual basis, provided there are reasonable grounds to suspect that such crime is transnational in nature and, including, the victims, witnesses, proceeds, means of committing crimes or evidence related to the commission of such crimes are located in the requested State Party, and that an organized criminal group is involved in the commission of this crime

The rules of the Criminal Procedure Code of Ukraine (Law of Ukraine No. 4651-VI, 2012) enshrines the following areas of international cooperation in the prosecution of transnational crimes: service of documents, execution of separate procedural actions, extradition of perpetrators, temporary transfer of persons, takeover of criminal proceedings, transfer of convicted and execution of sentences.

Consequently, a number of scientific works are devoted to various aspects of cooperation in the fight against transnational crime. However, to date there are no unified approaches regarding the essence of the concept of interaction, classification and content of its forms and methods.

In addition, the adoption of the new Criminal Procedure Code of Ukraine and the subsequent amending of related legal acts require revision and improvement of previously formulated proposals and recommendations on this issue.

Many scientists in their definitions note such signs of interaction as legal grounds, coherence

and the purpose (task) of this activity. At the same time, some authors try to expand the range of mandatory signs of this concept. The third attempted to reflect various aspects of the interaction: its external expression (joint activity); method of activity (organizational and tactical approach); individual features of activity (mutual trust, etc.). In general, all this testifies to the multifaceted nature of this problem.

However, in our opinion, it is possible and expedient to provide one common definition of the concept of interaction during the investigation of crimes committed by transnational organized criminal groups, what we tried to do as a result of the conducted research.

### Results and Discussion

Turning to the term of interaction, its following basic elements can be allocated: its foundation on law, cooperation between the independent bodies, coherence and purposefulness of activities, combination of means and methods for the purpose of preventing and solving crimes, bringing those guilty to criminal liability, search for the accused, provision of compensation for damage caused by offenses.

In criminal procedural science, interaction is considered as a legal institution. In the theory of operational and investigative activity, issues of interaction are investigated in relation to certain actors – operational units. In turn, forensic interpretation of interaction is closely related to the criminal procedural one. At the same time, the analysis of relevant scientific literature allows to ascertain the presence of different points of view on this issue, which can be grouped into three general approaches – broad, narrow and combined.

In a broad sense, the interaction of the investigator with the investigative and other agencies in the detection and prosecution of crimes can be defined as the unification of the efforts of the investigator with other law enforcement agencies for coordinated actions to achieve the common goal of detection and investigation of the crime, which is carried out in the forms provided for by law, departmental regulations or produced by practice (Stepaniuk & Zaiats, 2014).

In the narrow understanding, the investigator always acts as one of its actors, and the interaction itself is considered as a form of organization of the investigation. The interaction of the investigator with other participants in this

process is an activity coordinated by goals and tasks, forces, means, place and time in establishing the truth in criminal proceedings. The status of the investigator determines his main role, personal responsibility for the decisions made, and the results of the prosecution as a whole. All the activities of other participants in the investigation are subordinated to the tasks set before them by the investigator, and are coordinated by him (Shevchuk, 2017).

The narrow interpretation of interaction as a coordinated joint activity of the investigator with other bodies and actors is the most acceptable, therefore, it is most often presented in the procedural literature.

Following the essence of the concept, it can be argued that structurally interaction involves:

- a) coherence (coordination) of activity;
- b) joint activity;
- c) purpose of activity;
- d) certain content of activity;
- e) presence of at least two actors.

According to the third approach (combined), which lies in the effort to understand the interaction in different ways, there is an attempt to reflect various aspects of the interaction: its external expression (joint activity); method of activity (organizational and tactical approach); individual features of activity (mutual trust, etc.) (Saltevskyi, 2005). It seems that such an approach has a purely epistemological significance for clarifying the essence of the interaction and requires additional understanding regarding the possibility of introducing practical recommendations.

Priakhin (2022, p. 85) defined the essence of interaction as one of the important conditions for achieving success in the investigation of crimes by the bodies involved in this activity. When combating crime, law enforcement agencies form a unified system and perform their functions in accordance with the Constitution of Ukraine and other laws. At the same time, the law enforcement system is characterized by the fact that it includes management structures of various departmental subordination. The common goal, tasks, principles and nature of activity connect them into a coherent scheme. This also applies to the agencies and officials who exercise their powers during pre-trial investigation; the problem of their interaction is currently relevant, as it is directly related to strengthening the effectiveness of the fight against crime.

Dusheiko (2001, p. 12) provided the following formulation of interaction: it is correct (or rational) combination and effective use of powers, methods and forms of investigative and operative units' activities.

Another group of authors (Ablamskyi et al., 2017, p. 19) consider interaction as an organizational form of activity of two or more persons, which is jointly agreed and regulated by laws and other departmental regulatory acts and aimed at achieving the objectives of specific criminal proceedings.

The approval of the Criminal Procedure Code of Ukraine in 2012 somewhat transformed the essence of the pre-trial investigation of crimes. The new legal act has significantly expanded the powers of the criminal procedure actors; therefore, the correct combination and effective use of their authority is rather an intermediate goal of interaction, a condition for effectiveness, than its essence. Defining any activity only through its intermediate result is insufficiently substantiated. In such definitions, the mechanism of interaction remains undisclosed, since it is not clear how, due to what, the correct combination and effective application of different actors' methods and modalities is achieved. As we can see, the issue of interaction has remained out of the attention of legislators.

In turn, Topchii (2012, p. 146) defined interaction of the investigative and operational units as law-based joint coordinated (in terms of purpose, nature, place and time) activities aimed at solving the tasks of criminal justice under the guidance and the organizational role of the investigator and clear demarcation of competence.

Yefimov & Chaplinskyi (2023, p. 633) quite accurately formulated the definition of the interaction of pre-trial investigation bodies and operational units as the activities of independent individual subdivisions based on regulatory and legal acts, as well as coordinated in terms of purpose and conditions, which is reflected in the most effective combination of their own methods and means aimed at preventing and investigating illegal acts under the management of the authorized person.

In view of the above, we consider the opinion by Yukhno (2009, p. 35), who highlighted the significant role of the interaction of operational units in preventing illegal actions by law enforcement agencies, to be relevant. The author defined it as the joint activity of operative units

(within their competence) aimed at effective crime prevention, based on the law and by-laws, agreed upon in terms of goals, place and time. Besides, the scientist established the main types of interaction in the practice of preventing criminal offenses by relevant units. That is, the researcher formed in sufficient detail the essence of the interaction of units that existed at that time.

In our opinion, rational is the thesis by Maliuha (2016, p. 9), who noted that the interaction of the investigator with operative units and other criminal proceedings actors should be considered as joint functioning of external (legal, organizational, professional) not subordinate subjects of interaction with their inherent communicative – activity or/and specific – professional competence, specialization coordinated by the investigator (prosecutor – procedural manager) in time, place, forms, as well as means and methods of implementation for solving specific tasks determined by the nature of the investigative situation, with the aim of ensuring quick, comprehensive and impartial investigation of crimes and their prevention, which is directed and enshrined in the law, departmental regulations or recommended by forensic science.

For his part, Danyliak (2018, p. 16) formulated the concept of interaction during the investigation of economic crimes committed by organized groups as a complex of mutual relations of the investigator with other actors, the range of which depends on the specific situation and tactical tasks arising during the detection, termination, proving crimes of this type, bringing those guilty to criminal liability, as well as preventing the commission of these offenses. The author also substantiated that the interaction during the investigation of economic crimes committed by organized groups should be considered at general and special levels.

In other words, all the above-mentioned scientists provided a definition of interaction in view of the existing system of law enforcement agencies and their inherent functions.

At the same time, the Instructions on the organization of cooperation of pre-trial investigation bodies with other bodies and units of the National Police of Ukraine in the prevention of criminal offenses, their detection and investigation (Order No. 575, 2017) enshrines that interaction between criminal police units and pre-trial investigation bodies is carried out in the case of: receiving statements and notifications about criminal offenses and

responding to them; submitting the materials based on the results of operational and investigative activities to the pre-trial investigation body by the operational unit; creation of investigative and operative groups for pre-trial investigation of criminal offenses; receiving the instructions from investigators on the conduct of investigative (search) actions and covert investigative (search) actions by the employees of the operational unit of the body, the police unit; carrying out separate investigative (search) actions and implementing measures to ensure criminal proceedings; ceasing the pre-trial investigation at the stage of judicial review of criminal proceedings.

The main principles of such interaction are:

- 1) prompt, complete and impartial investigation of criminal offenses;
- 2) the independence of the investigator in procedural activities, interference in which by persons without legal authority are prohibited
- 3) optimal use of the available resources of pre-trial investigation bodies and operational units of the National Police of Ukraine in preventing, detecting and investigating criminal offenses;
- 4) compliance with the general principles of criminal proceedings;
- 5) ensuring non-disclosure of pre-trial investigation data.

In accordance with Clause 2 of the Instruction on the cooperation of law enforcement agencies in the field of combating organized crime (Order No. 317/235, 2011), the purpose of the cooperation of the relevant law enforcement agencies is to strengthen countermeasures against organized criminal groups, including those of an interregional and transnational nature, created on an ethnic basis with corrupt connections, as well as prevention, detection and investigation of crimes committed by organized criminal groups and criminal organizations.

This interaction is carried out:

at the central level – between the Main Directorate for Combating Organized Crime of the Ministry of Internal Affairs of Ukraine and the Main Directorate for Combating Corruption and organized crime of the Security Service of Ukraine;

at the regional level – between the departments for combating organized crime of the main departments, departments of the Ministry of Internal Affairs of Ukraine in the regions, cities

of Kyiv and Sevastopol and the main departments for combating corruption and organized crime of the bodies of the Security Service of Ukraine in the regions, cities of Kyiv and Sevastopol.

Two main directions of interaction of law enforcement agencies in the field of combating organized crime are allocated:

strategic – organizing the implementation of state policy in the field of combating organized crime, eliminating the causes and conditions of its existence, improving the legal framework for combating it.

Tactical – detection, documentation and termination of the activities of organized criminal groups, criminal organizations, prevention, disclosure and investigation of crimes committed by them, search and arrest of members of organized criminal groups, compensation for losses to the state, individuals and legal entities.

The cooperation between the authorized agencies can be implemented in the following forms:

- conducting joint analysis of the state, structure of organized crime, causes and conditions contributing to the activity of organized groups, forecasting trends in the spread of organized crime;
- exchange of operational information of interest for fighting organized crime;
- developing and implementing joint programs and plans in the fight against organized crime;
- creating working groups for the preparation of draft laws and proposals for amending the legislation;
- implementation of agreed operational search, preventive and other measures;
- preparing and conducting joint boards, meetings, seminars on improving cooperation;
- developing educational programs and holding trainings within the professional training system;
- improving international cooperation in the fight against organized crime;
- informing public about the results of the activities in the field of combating organized crime.

It is worth noting that transnational organized crime under modern circumstances quickly adapts to new conditions and constantly improves the means and methods of criminal

activity; therefore, effective counteraction to transnational organized crime requires relevant State policy and constant improvement of theoretical knowledge and practical skills by law enforcement officers. Therefore, clear and organized interaction of law enforcement agencies of both a specific State and interstate structures plays a significant role in the efficiency of the investigation of illegal acts by the category under investigation (Bekh, 2020, p. 203).

Let us stress on the fact that full interaction is when the subject with managerial authority treats the hierarchically subordinate entity as a complete entity without ignoring its subjective features in the process of their common activity.

At the same time, the subject of interaction is always specific. Its experience, both positive and negative, recorded in the system of knowledge, skills, abilities, value orientations, motives, attitudes, stereotypes, is actively used in everyday activities.

Consequently, actor of interaction is characterized by subjective features acquired in the process of its formation and development: activity, awareness of oneself as a subject in relation to other subjects, uniqueness, will to act, involving free choice of specific goals. In addition, collective subject interaction is characterized by an internal structural construction, the distribution of functions between its components and their interdependence, which is not reduced to the arithmetic sum of elements, as well as collective consciousness and self-awareness, determining the presence of group reactions and the collective will to act (Sakovskiy & Zhyzhyn, 2019, p. 51).

Pitsik (2022, p. 676), having studied and analyzed the works by numerous scholars on the issues presented above, correctly testified that the following aspects within the conducted research remain unexplored to date: organization of the work of the Department of Strategic Investigations units regarding operational and investigative countermeasures against the activities of criminal communities and individuals under the status of aggravated criminal influence; tactics of operational and investigative countermeasures against such activities; its documenting; conceptual provisions of operative and investigative support for criminal proceedings regarding the activities of criminal communities and persons under the status of aggravated criminal influence; forming strategic decisions aimed at ensuring operative

and investigative countermeasures against the named activities; interaction of law enforcement agencies of Ukraine regarding operative and investigative countermeasures against such operations; international cooperation on neutralizing the influence of the "thief" community (using foreign experience).

That is, the author, among other things, established international cooperation and collaboration of law enforcement agencies of Ukraine in relation to operational and investigative countermeasures against the activities of criminal communities.

Filashkin (2011, p. 240) also highlighted the importance of cooperation between international law enforcement and police organizations, for example, Interpol and Europol, for coordinating efforts to combat crimes of a transnational nature. The author emphasized that the international organization of the criminal police in Ukraine represents the National Central Bureau of the Interpol – Ukrbureau Interpol, which is the center of coordination of the interaction of law enforcement agencies of the country with the competent authorities of foreign States in the fight against crime, is of transnational nature or goes beyond the borders of the country. In addition, the researcher noted that the unit directly responsible for the organization of the performance of the functions of the Ministry of Internal Affairs of Ukraine as the National Central Bureau of Interpol is the working apparatus of the Ukrainian Bureau of Interpol.

In view of the above, we believe that the position of the group of scientists (Chaplynskyi et al., 2023, p. 479), who noted that the interaction of the National Police of Ukraine with international organizations takes place at the global and regional levels, is quite valid. The best results are manifested in the process of cooperation between law enforcement agencies of Ukraine and the Working Apparatus of the Ukrainian Bureau of Interpol, the purpose of which is:

the exchange of information resources, the establishment of persons, things and documents recorded in the Interpol databases; assistance in the international search for criminals; implementation of extradition measures; performance of procedural actions at the international level.

These types of cooperation also have a forensic direction. This refers to the information

component characterizing the investigated criminal offenses and assisting in their disclosure. As a conclusion, we can state that persons, objects and documents registered in the Interpol database are also related to forensics, because forensic methods of diagnosis and identification, as well as various forensic techniques are used.

A separate group of scientists noted quite clearly that schematically, the channel of passing information or carrying out interaction is as follows:

practical division of the law enforcement agency of Ukraine → territorial division of the Interpol National Security Agency → Interpol National Security Agency of Ukraine → Interpol National Security Agency of the foreign country → police (practical) division of the law enforcement agency of the foreign country.

Feedback can also be illustrated:

police unit of the foreign country → Interpol National Security Agency of the foreign country → Interpol National Security Agency of Ukraine → territorial unit of Interpol National Security Agency → practical unit of the law enforcement agency of Ukraine.

The specified information flow scheme is not the only possible one, which may be determined by the actors of such interaction, the tasks to be solved in a specific case of cooperation, etc. For example, if the request of the law enforcement agency of the foreign country concerns the verification of a person on criminal records, the National Security Service of Interpol of Ukraine will interact with the Department of Informational Technologies of the Ministry of Internal Affairs of Ukraine to obtain relevant information or will verify the availability of information on the person on the records of this unit. In cases where the request concerns the search for a person, the National Central Bureau will also interact with criminal investigation or combat organized crime units; in the materials regarding the verification of business entities, the legality of foreign economic transactions – with the State Tax Administration, the State Service for Combating Economic Crime of the Ministry of Internal Affairs of Ukraine (Bilenchuk et al., 2009, pp. 14-15). As one can see, the researchers clearly and correctly summarized the previous information.

We consider the opinion by Schneider (2018, p. 26), who emphasized that relying on

potentially questionable justice officials, now limited anti-mafia criminal justice to one transformative achievement – the suppression of drug trafficking and elimination of related violence, to be reasonable one. In other words, the interaction of law enforcement agencies with justice ensured a certain effectiveness in preventing the commission of criminal offenses.

We also support the view by Liash (2000, p. 126), who defined the essence of the interaction between the investigator and the operational worker in the following components: a) active purposeful activity of the actors – investigators and workers of operational units, which may involve secret employees, public members, specialists in various fields of knowledge, etc.; b) each subject of this activity takes specific measures (investigative, operative and investigative) within the limits of the powers established by law; c) these are joint actions of two or more actors, agreed in place, time and purpose, aimed at implementing the obtained results of operational and investigative measures, information in criminal proceedings; d) overall plans should include a combination of surveillance and other activities in such a way that their implementation is unexpected for the persons whose actions are being verified, their co-conspirators and would have the greatest effect of establishing the facts in a procedural manner; e) in the process of conducting specific operational and investigative actions, it is necessary to strictly comply with the requirements of the Constitution of Ukraine, current legislation, principles of operational-investigative legislation and criminal justice through appropriate investigative actions and procedural decisions.

Thus, we can formulate the concept of law enforcement cooperation during the investigation of crimes committed by transnational organized criminal groups as a system of measures independent from each other in relation to the subordination of authorized units, which is based on relevant legal acts and agreed between them according to the purpose and circumstances, which consists in effective and quick combination of methods and means peculiar to the relevant departments, aimed at preventing and investigating crimes under a single administration.

## Conclusion

Summing up, we note that the commission of criminal offenses by transnational organized criminal groups cannot be effectively

investigated without the participation of various units both in Ukraine and abroad. It is stated that interaction is one of the main prerequisites for ensuring any activity, and even more so for the implementation of criminal proceedings of any category. At the same time the issue of interaction was left out of the attention of legislators in terms of establishing the relevant rules in codified legal acts. On the other hand, the scholars defined interaction in view of the existing system of law enforcement agencies and their inherent functions. It is noted that the clear and organized interaction of law enforcement agencies of both a specific state and interstate structures plays a significant role in the effectiveness of the investigation of illegal acts of the studied category. The possibility of interaction between only indicated persons is pointed out (investigator and case officer; several investigators; several case officers; detective and operative; several detectives). Emphasis is placed on an essential feature of interaction – single management by a specific authorized person. Attention is focused on the mandatory involvement of international law enforcement organizations – Interpol and Europol. It is found that the interaction of law enforcement agencies with justice will ensure a certain effectiveness in preventing the commission of illegal acts. The concept of law enforcement cooperation during the investigation of crimes committed by transnational organized criminal groups is formulated as a system of independent actions with respect to the reporting lines of authorized units, which is based on relevant legislation and agreed between them on the purpose and circumstances, which lies in effective and rapid combination of the methods and means specific to the relevant units, aimed at preventing and investigating crimes under a single management.

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## Impact of illegal orders on the Ukrainian banking system: a constitutional analysis

Вплив незаконних розпоряджень на банківську систему України: конституційний аналіз

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### Abstract

This article examines illegal orders and orders in the field of the banking system from the point of view of constitutional law. The study includes a review of constitutional norms and principles related to banking, analysis of specific cases of issuance of illegal orders, as well as study of mechanisms for protecting the rights of subjects of banking relations. The purpose of the article is to analyze illegal orders and orders in the banking system in the context of constitutional rights and freedoms. The methodology of the article includes such methods as: analysis method, historical-legal method, comparative method, logical method. As a result of the study, it was concluded that the Constitution of Ukraine enshrines basic rights and freedoms that directly affect the functioning of the banking system. In particular, this is the right to property, entrepreneurial activity, and the right to legal

### Анотація

У цій статті розглядаються протиправні розпорядження і накази у сфері банківської системи з точки зору конституційного права. Дослідження включає в себе огляд конституційних норм та принципів, що стосуються банківської діяльності, аналіз конкретних випадків видачі протиправних наказів, а також вивчення механізмів захисту прав суб'єктів банківських відносин. Метою статті є аналіз протиправних розпоряджень та наказів у сфері банківської системи в контексті конституційних прав та свобод. Методологію статті включають такі методи, як: метод аналізу, історико-правовий метод, порівняльний метод, логічний метод. У результаті дослідження підсумовано, що Конституція України закріплює основні права і свободи, які безпосередньо впливають на функціонування банківської системи. Зокрема,

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protection. The study showed that these constitutional guarantees are key to protecting the rights of subjects of banking relations from illegal orders and orders. The results of the study emphasize the need to improve the legal regulation of banking activity in Ukraine, in particular by eliminating existing shortcomings in the legislative framework and strengthening the mechanisms for protecting the rights of subjects of banking relations. The implementation of the proposed recommendations will contribute to ensuring legality and law and order in the banking sector and increasing trust in the banking system of Ukraine.

**Keywords:** illegal orders, orders in the field of the banking system, banking system, illegal influence, legal demand.

## Introduction

In the context of economic instability and crisis phenomena, it is especially essential to guarantee the legality of the actions of state bodies and officials regulating banking activity. Illegal orders can lead to the destabilization of the banking system and the loss of trust on the part of customers and investors.

The relevance of the study is because the constitutional right to property protection and the legitimate economic interests of citizens and enterprises are key elements of a democratic society. Illegal orders in the banking sector may violate these rights, which requires analysis and development of protection mechanisms. Illegal actions in the banking sector create legal uncertainty and risks for economic entities, which negatively affects the economic stability of the country. Therefore, the analysis of cases of illegal orders in the banking sector will help identify gaps in the current legislation and develop recommendations for its improvement, which will contribute to strengthening the legal protection of banks and their clients.

The object of the study is social relations in the field of banking activity, which arise in connection with the issuance and implementation of orders and orders of state authorities, regulatory bodies, as well as banking institutions themselves.

The subject of the study is illegal orders and orders in the field of the banking system, and their constitutional and legal aspects, including:

це право на власність, підприємницьку діяльність, та право на судовий захист. Дослідження показало, що ці конституційні гарантії є ключовими для захисту прав суб'єктів банківських відносин від протиправних розпоряджень і наказів. Результати дослідження підкреслюють необхідність вдосконалення правового регулювання банківської діяльності в Україні, зокрема шляхом усунення існуючих недоліків у законодавчій базі та посилення механізмів захисту прав суб'єктів банківських відносин. Впровадження запропонованих рекомендацій сприятиме забезпеченню законності та правопорядку у банківській сфері та підвищенню довіри до банківської системи України.

**Ключові слова:** протиправні розпорядження, накази в сфері банківської системи, банківська система, незаконний вплив, законна вимога.

Regulatory and legal framework that regulates banking activities and protects the rights and freedoms of subjects of banking relations.

Constitutional norms and principles guarantee protection against unlawful orders and orders.

The practice of issuing and challenging illegal orders and orders in the banking sector.

Mechanisms to protect the rights of subjects of banking relations against illegal actions of state bodies and officials.

Causes and consequences of illegal orders and orders in the banking sector.

International experience and standards in the field of banking regulation and protection of the rights of subjects of banking relations.

Regarding the main tasks of the research, we note the following.

The tasks are:

1. Analysis of constitutional guarantees in the banking sector.
2. Analyze the laws of Ukraine that regulate banking activity (in particular, "On banks and banking activity" and "On the National Bank of Ukraine") and identify gaps and inconsistencies in legislative acts that may contribute to the adoption of illegal orders and orders.

3. Assess the effectiveness of existing mechanisms for protecting the rights of subjects of banking relations, such as judicial protection, control, and supervision by the National Bank of Ukraine.
4. Identify the main causes of illegal orders and orders in the banking sector, such as abuse of power, insufficient control and supervision, and political influence. And
5. Based on the analysis, develop recommendations for improving the legislative framework and increasing the effectiveness of the mechanisms for protecting the rights of subjects of banking relations.

The fulfillment of the specified research tasks will allow a comprehensive assessment of the problem of illegal orders and orders in the banking system of Ukraine, identify the main factors contributing to their occurrence, and develop effective measures for their prevention. This will contribute to increasing the legal protection of the subjects of banking relations and strengthening the stability and trust in the banking system of Ukraine.

The structure of the article can be outlined as follows:

### Introduction

- Overview of the topic: Examination of illegal orders and orders within the banking system from a constitutional law perspective.
- Purpose: Analyze illegal orders in the banking system in the context of constitutional rights and freedoms.

### Theoretical Framework and Literature Review

- Review of constitutional norms and principles relevant to banking.
- Analysis of specific cases involving illegal orders in the banking sector.
- Study of existing literature on mechanisms for protecting the rights of subjects in banking relations.

### Methodology

- Description of the methods used in the study:
  - Analysis method
  - Historical-legal method
  - Comparative method

- Logical method

### Results and Discussion

- Findings on how the Constitution of Ukraine enshrines basic rights and freedoms affecting the banking system.
- Key constitutional guarantees, such as the right to property, entrepreneurial activity, and legal protection.
- Analysis of how these guarantees protect banking subjects from illegal orders.
- Discussion on the need for improved legal regulation in the Ukrainian banking sector.
- Identification of shortcomings in the current legislative framework and recommendations for strengthening mechanisms to protect banking rights.

### Conclusions

- Summary of the study's conclusions on the constitutional protections for banking subjects.
- Emphasis on the importance of enhancing legal regulations and mechanisms to ensure legality and trust in Ukraine's banking system.
- Recommendations for legal and regulatory improvements to support law and order in the banking sector.

Thus, the study of illegal orders and orders in the field of the banking system from the constitutional aspect is extremely relevant and will contribute to the improvement of the legal regulation of banking activity in Ukraine, the protection of the rights of subjects of banking relations, and the improvement of the general legal culture in the state.

### Theoretical Framework or Literature Review

In the study of Baryshnikov (2009), the issue of the collection of an administrative fine in the context of banking was considered. It was remarked that among the types of administrative fines, fines play a based role in preventing violations, training, and deterring further illegal actions. However, not only the fact of its use but also its specific size is crucial. The size of the fine ultimately reflects the principle of the effectiveness of the sanction as a means of ensuring compliance with the law. The size of the fine imposed on the offender (whether it is a natural person or a legal entity) affects his consciousness and motivation to refrain from similar actions in the future.

Bordyuk (2014) considered the banking supervision systems of foreign countries. It was found, that in different countries, there are various systems of supervision of commercial banks, which can be centralized or distributed among different bodies. In many countries, such as Great Britain, Italy, and the Netherlands, the central bank is responsible for supervising commercial banks. Canada and Switzerland have separate supervisory bodies separate from the central bank. In Germany, the USA, and Japan, there is a mixed system, where the responsibilities of supervision are divided between the central bank and the state authorities. There are different types of control over the activities of commercial banks, such as state, departmental, and independent. State control is carried out through legislation that regulates banking activities. Departmental control consists of supervision by the central bank of the country. Independent control is carried out by independent audit firms. In the banking systems of developed countries, there are commercial and central banks. Commercial banks can be universal or specialized. Universal banks carry out a variety of banking operations, while specialized banks specialize in specific types of operations. In some countries, bank specialization is mandatory due to legislation, but many banks are still expanding their operations. The tendency towards the predominance of one type of bank in a country may change as a result of the liberalization of legislation or through the circumvention of existing laws. For example, in countries where specialized banks prevail, a trend towards universalization may appear. After all, many countries have a combination of both types of banks in their banking system.

Vlasova (2006) found out the reasons for the NBU's use of influence measures. It has been established that the list of grounds for the application of influence measures by the National Bank of Ukraine shows that not all of them correspond to the general grounds defined in Article 73 of the Law of Ukraine "On Banks and Banking Activity". This may lead to the appeal of decisions on the application of these measures based on part 2 of Article 19 of the Constitution of Ukraine, which requires that state and local self-government bodies, as well as their officials, act only on the basis, within the limits of authority and in the manner provided for by the Constitution and laws of Ukraine. In addition, the method of determining the grounds for the application of influence measures, outlined in the Regulation on the application of influence measures by the NBU for violations of banking legislation, approved by Resolution of the NBU

Board dated August 28, 2001 No. 369, contains many assessment norms and causes particular difficulties in the process of proving the existence of relevant grounds. In this regard, one of the vital directions of further research should be the improvement of the legal regulation of the grounds for the application of NBU influence measures, taking into account possible sources of evidence of the existence of such grounds.

Gotvyanskyi (2016) investigated the current state of fraud in the field of economic activity. Dmytrenko (2021) analyzed the peculiarities of legal regulation of banking relations in the context of Ukraine's European integration. Thus, it was noted that Ukraine, having signed the Association Agreement, undertook to implement the standards, principles, and legal norms regulating banking activities in the EU into the banking legislation. Significant for the regulation of the banking services market within the EU, and which have already been implemented or are subject to implementation into Ukrainian legislation, according to the authors, are EU documents containing financial monitoring mechanisms and the basic principles of financial institutions. Since these provisions are only partially integrated into Ukrainian legislation, work on their consolidation should continue. Particular attention should be paid to the harmonization of legislation with the rules, requirements, and recommendations of the Basel Committee on Banking Supervision, in particular, regarding the introduction of minimum capital adequacy and liquidity ratios to reduce the outflow of capital from Ukraine. Given several problems in the banking system of Ukraine in the period 2015-2020, including during the financial crisis and pandemic, current priorities include: strengthening control and responsibility of financial market participants; introducing special requirements for indicators of systemically important banks and other financial institutions; improvement of the system of regulation and supervision of financial institutions; ensuring transparency of activity and reporting of financial market participants; transition of banks and non-banking financial institutions to international financial reporting standards; reduction of the state's share in the banking system, etc. The implementation of these and other measures will contribute to the adaptation of the Ukrainian banking system to EU standards, which, in turn, will ensure the provision of modern and high-quality banking services by Ukraine's European integration course.

Zhuk (2020) carried out a comprehensive analysis of the legal regulation of banking activity in the criminal legislation of foreign countries. From the point of view of improving the domestic criminal law regulation of banking activity, in the author's opinion, the following foreign law-making experience is useful: the presence of administrative prejudice as a condition for criminal liability; increased attention to protecting the rights and legitimate interests of creditors, in particular establishing liability for several violations related to bankruptcy proceedings and debt collection; encouraging positive post-criminal behavior by establishing special types of exemption from criminal liability.

Emelyanov (2011) investigated the problematic aspects of organizational and legal protection of bank secrecy in Ukraine. It was finalized that in the conditions of the development of the information society, market economic relations, and the expansion of international cooperation, the issue of BT protection becomes especially relevant. Ukraine has created its own BT protection system, which demonstrates positive development trends and meets world standards. BT is a separate type of IPR and has a specific protection regime that is not identical to any other legal privacy regime. Legislative regulation of BT circulation in modern conditions requires constant research and improvement. Therefore, it is significant to develop and adopt a special law of Ukraine on BT, which would eliminate the analyzed problematic aspects and shortcomings of the current legislation.

Luk'yanets (2006) analyzed administrative-delic relations in Ukraine. The main focus of the monograph is on the content of administrative-delic relations, modern concepts of administrative responsibility, principles of construction and implementation of a normative model of administrative responsibility in modern conditions, as well as problems of systematization of administrative-delic legislation.

Yepifanov, Plastun, & Dombrovskiy (2009) carried out a comprehensive analysis of the financial security of enterprises and banking institutions. The monograph examines the essence of the concept of financial security at both the micro and macro levels and examines the causes of crises and methods of their prevention. Special attention is paid to the problems of ensuring financial security in Ukraine, analysis of the current state of the banking system of Ukraine from the point of

view of its financial security, as well as theoretical approaches to the formation and implementation of the financial security system in the activities of enterprises and banks. In addition, the work proposes several innovations and improvements to the existing theoretical base in the field of financial security for enterprises and banks.

Nadobko (2016) analyzed the issue of administrative responsibility for violations of legislation on banks and banking activities, namely, he carried out a general description of administrative responsibility for violations of banking legislation, investigated the legal grounds of administrative responsibility for violations of legislation on banks and banking activities, features of the application of administrative responsibility in the banking sector, types of administrative penalties for violations of banking legislation, as well as problems and prospects for improving administrative responsibility for violations of legislation on banks and banking activities.

Melnyk (2017) paid attention to the classification of financial fraud in a commercial bank and noted that further research in this direction involves the study of the place and role of financial fraud in the system of ensuring the financial security of a commercial bank, as well as the mechanisms of its detection, countermeasures, and prevention.

Kryushenko (2015) considered the methods of fraud in the banking sector and noted that the peculiarities are the specifics of this sector and access to data. Shapoval (2016) considered the general issues of the constitutional law of Ukraine and singled out and systematized the key provisions in the textbook.

Finageev (2016) analyzed the ways of committing crimes related to the use of means of access to bank accounts. The scientist distinguishes 3 groups of ways of concealing crimes related to illegal access to bank accounts: Concealment of a crime by masking information and its carriers:

- change of legal address and actual location of the enterprise;
- transfer of the employee to another job (to another unit or institution);
- use of forged payment documents and technological errors to hide illegal transactions;

- multiple transfers of funds between accounts, mixing of legal and criminally obtained funds on different accounts;
- conversion and transfer into cash of illegally obtained funds;
- various operations for the legalization (laundering) of proceeds obtained through crime.

Concealment of a crime due to the destruction of information and its carriers:

1. liquidation of enterprises and financial institutions;
2. destruction of objects and documents, with the help of which the crime was committed (for example, payment documents, accounting reports, records in electronic payment systems), through their concealment, loss, or illegal acquisition.

Concealment of a crime due to falsification of information and/or its carriers:

- providing knowingly false testimony;
- distortion of financial, statistical, technological, tax, and other documentation;
- threats, persuasion, or bribery of employees of bank security, law enforcement, and control bodies;
- the use of corruption cover-up and other methods of countering the investigation.

Podolyan (2020) investigated transactions in the field of banking activity in the context of historical and legal analysis, that the legal regulation of banking operations granted powers to each type of banking institution through separate transactions and a set of transactions, which were determined primarily by the functions of these institutions. At the same time, the list of these operations, established in the legislation, was gradually expanded thanks to the improvement of regulatory acts. The major banking operations for each type of credit institution remained practically unchanged, and the number of such operations increased due to new additional operations, which became separate types of transactions. Attention was also drawn to the fact that the lack of mandatory licensing of banking operations led to insufficient regulation of the activities of commercial banks, which allowed them to act independently within the limits of their charter. In general, according to the researcher, the regulation of banking activity in the researched period had a multi-level character, which was reflected in the adoption of laws and by-laws. Most of the by-laws were passed for state-owned

and small credit institutions, while for joint-stock commercial banks, the instructions and orders were not sufficiently specified, resulting in a number of restrictions and regulations. Another shortcoming of the banking legislation of that period was the significant dynamics of legal regulation, which was expressed in the constant reformation of legal norms, which did not contribute to the stable operation of banking institutions. In addition, the state influence on the banking system was significant, which was manifested in the ability of state authorities to make changes to the charters of banking institutions.

The following is observed from the above analysis. The main research trend is focused on the study of constitutional guarantees that protect the rights and freedoms of subjects of banking activity. Another trend concerns the analysis of the legislative framework that regulates banking activities in Ukraine. Researchers are actively studying the mechanisms of protection of the rights of subjects of banking relations against illegal orders and orders. This includes: an analysis of the role of the judicial system in protecting the rights of subjects of banking relations; a review of the decisions of the Constitutional Court of Ukraine, which concern banking activity; development of proposals for the creation of specialized bodies or procedures for quick response to illegal actions in the banking sector. There is also considerable interest in the influence of international law and practices on the regulation of banking activity in Ukraine and the study of practical aspects of the implementation of constitutional norms in banking activity.

Therefore, the study of illegal orders and orders in the field of the banking system from the constitutional aspect is multifaceted and covers a wide range of issues. The main research trends are focused on ensuring constitutional guarantees, improving the legislative framework, developing mechanisms for protecting the rights of subjects of banking relations, the influence of international law and practices, as well as on practical aspects of the implementation of constitutional norms in banking. These studies are extremely important for ensuring the law and order and stability of the banking system of Ukraine.

## Methodology

Let's see how each method will be applied in the study, along with concrete examples:

**Analysis Method:**

- **Constitution of Ukraine:**
  - Study of constitutional provisions guaranteeing the rights and freedoms of banking subjects.
  - Example: Analyzing articles related to property rights, entrepreneurial activity, and legal protection.
- **Laws of Ukraine:**
  - Examination of legal norms governing banking activities.
  - Example: Analyzing provisions from laws such as "On banks and banking activities" and "On the National Bank of Ukraine" regarding the legality of orders and instructions.
- **By-laws:**
  - Review of resolutions, orders, and directives that regulate the banking sphere.
  - Example: Analyzing specific directives issued by regulatory bodies regarding banking operations and their conformity with constitutional principles.

**Historical-Legal Method:**

- **Historical Development of Legislation:**
  - Tracing the evolution of banking laws and regulations over time.
  - Example: Analyzing how changes in banking legislation have influenced the prevalence of illegal orders and instructions.
- **Trends and Regularities:**
  - Identifying patterns in the issuance of illegal orders and instructions.
  - Example: Studying historical cases of illegal orders in the banking sector and identifying recurring themes or causes.

**Comparative Method:**

- **Comparison with International Norms:**
  - Contrasting Ukrainian legislation with international legal standards.
  - Example: Comparing Ukrainian banking laws with those of other countries to identify areas of convergence or divergence in addressing illegal orders.

**Study of International Practices:**

- Analyzing international standards, recommendations, and practices in the banking sphere.
- Example: Examining how other countries handle illegal orders and instructions in their banking systems and assessing their effectiveness.

**Logical Method:**

- **Data Structuring:**
  - Organizing collected information in a logical manner.
  - Example: Categorizing findings from the analysis of constitutional provisions, laws, and historical data into coherent themes.
- **Conclusion Formulation:**
  - Drawing logical conclusions based on the analysis.
  - Example: Formulating recommendations for improving the legal framework to address identified issues related to illegal orders in the banking sector.

By employing a combination of these methods, the study aims to provide a comprehensive understanding of illegal orders and instructions in the banking system from a constitutional perspective. This multifaceted approach enables the identification of problems, assessment of their causes and consequences, and development of recommendations for legal improvements to ensure legality and order in Ukraine's banking sector.

**Results and Discussion**

In the current conditions of the development of the banking system of Ukraine, special attention should be paid to the constitutional aspects of the legality of orders and orders issued in this area. The Constitution of Ukraine defines the basic principles by which state authorities and their officials must act, which is necessary for ensuring the stability and legality of the functioning of the banking system.

According to Part 2 of Art. 19 of the Constitution of Ukraine, state authorities and local self-government bodies, their officials are obliged to act only on the basis, within the limits of authority and in the manner provided by the Constitution and laws of Ukraine. This principle is key in the context of considering the legality of

orders and orders issued in the field of banking activity (Law No. 254к/96-VR, 1996).

Orders and orders in the banking sector must comply with the legislation of Ukraine, including the norms regulating banking activities. In particular, the Law of Ukraine "On Banks and Banking Activity" establishes general grounds for the issuance of normative legal acts that regulate the activities of banks and their interaction with the National Bank of Ukraine (NBU) (Law No. 2121-III, 2000). The National Bank of Ukraine, in turn, issues orders that must meet the requirements of the Constitution and other laws of Ukraine (Law No. 679-XIV, 1999).

In the banking system of Ukraine, situations may arise when illegal orders and orders are issued that contradict the Constitution and current legislation. Such actions can have serious consequences for both banking institutions and the country's economy as a whole.

Illegal orders and orders in the field of the banking system can be defined as those that:

1. They contradict the norms of the Constitution of Ukraine.
2. They violate the current banking legislation.
3. They are beyond the authority of the person issuing them.
4. Aim for illegal enrichment or other selfish purposes.

Examples of such illegal actions can be orders to carry out operations that violate the principles of financial monitoring, or orders that facilitate money laundering.

Therefore, decrees and orders that contradict the Constitution of Ukraine, and laws issued more than authority are considered illegal. Such acts may be challenged in court, and their execution may be suspended. An important aspect is also the assessment of the legality of the actions of officials who issue or execute such orders and orders (Luk'yanets, 2006).

Illegal orders and orders in the banking sector:

- Illegal acts of regulatory bodies.
- The compulsion to perform actions contrary to the law.
- Interference in the internal affairs of banking institutions (Finageev, 2016).

Officials who issue illegal orders or orders are liable following the current legislation of Ukraine. It can be disciplinary, administrative, or

criminal responsibility depending on the nature of the offense. In this context, it is also important to ensure effective mechanisms of control and supervision of the activities of such officials by the relevant authorities. In addition, the Constitutional Courts play an important role in the protection of rights and freedoms in the banking sphere, ensuring compliance of national legal acts with constitutional norms and international standards.

Regarding international standards in the field of banking activity, the main international standards that regulate banking activity are:

- Basel Principles: The Basel Committee on Banking Supervision sets standards for effective supervision of banks (Bis, 2012; and
- FATF Recommendations: Aimed at Combating Money Laundering and the Financing of Terrorism (FATF, 2018).

International organizations such as the International Monetary Fund and the World Bank, and at the national level the National Bank of Ukraine also provide recommendations on protecting banking systems from illegal interference. They contribute to the implementation of effective regulation and supervision that meets international standards (Resolution No. 23, 2022).

The strategy for the development of the financial sector of Ukraine until 2025 (Ministry of Finance of Ukraine, s.f) provides for:

- Effective regulation of the financial sector and improvement of supervisory approaches
- Transparent financial sector
- Resilience of the financial sector to challenges (shocks)
- Improving the quality of corporate governance and risk management in the financial sector
- Increasing the availability and level of use of financial services
- Strengthening the protection of the rights of consumers of financial services
- Increasing the level of financial literacy of the population.

Let's consider the problematic issues of detection and prevention of illegal orders and orders in the banking sector.

1. The imperfection of the legislative framework

- Gaps and inconsistencies in legal acts regulating banking activities.
  - The lack of clear demarcation of powers between different state bodies creates opportunities for abuse of power.
2. Insufficient judicial protection
- The length of court proceedings and insufficient independence of the judicial system make it difficult to challenge illegal orders and orders.
  - Low effectiveness of the existing mechanisms for protecting the rights of subjects of banking relations.
3. Lack of effective control and supervision
- Insufficient control by the National Bank of Ukraine and other regulatory bodies.
  - Absence of effective mechanisms for rapid response to illegal actions.
4. Political influence and corruption
- The influence of political forces on the adoption of orders and orders in the banking sector.
  - Spread of corruption, which undermines confidence in the banking system and creates conditions for abuse of power.
5. Low legal awareness of subjects of banking relations
- Insufficient awareness of citizens and legal entities regarding their rights and mechanisms for their protection.

Ways to solve these problems can be:

Improvement of the legislative framework.

Carrying out a comprehensive revision of legislation regulating banking activities to eliminate gaps and inconsistencies.

Amendments to the laws of Ukraine "On Banks and Banking" (Law No. 2121-III, 2000) and "On the National Bank of Ukraine" (Law No. 679-XIV, 1999) clearly demarcate the powers of state bodies and increase their responsibilities.

- Increasing the effectiveness of legal protection

Reform of the judicial system to ensure its independence and efficiency in the consideration of cases related to banking activities.

Introduction of specialized courts for consideration of banking disputes.

- Strengthening control and supervision

Improvement of control mechanisms by the National Bank of Ukraine, in particular by introducing a system of early warning and response to illegal actions.

Increasing the transparency of regulatory bodies and creating independent commissions to oversee their activities.

- Prevention of political influence and fight against corruption

Introduction of stricter anti-corruption measures in the banking sector, including control over the income and expenses of officials.

Development of mechanisms to prevent political influence on decision-making in the banking sector.

- Increasing legal awareness

Conducting information campaigns and educational programs to increase the legal awareness of citizens and legal entities regarding their rights in the banking sector.

Solving problematic issues related to illegal orders and orders in the banking system requires a comprehensive approach, which includes improving the legal framework, reforming the judicial system, strengthening control and supervision, preventing political influence and fighting corruption, as well as increasing legal awareness of sub-objects of banking relations. The implementation of these measures will contribute to the strengthening of law and order in the banking sphere and increase trust in the banking system of Ukraine.

Ensuring the legality of orders and orders in the field of banking activity is an important task that requires compliance with constitutional principles, improvement of legislation, and effective control. Only under such conditions is it possible to achieve stable and legal functioning of the banking system of Ukraine, which will meet international standards and contribute to the protection of the rights and interests of all financial market participants.

## Conclusions

1. According to the first task and the second task, with the help of the historical-legal method, the method of analysis, and logical methods, it was established that the Constitution of Ukraine enshrines the basic rights and freedoms that directly affect the functioning of the banking system. This includes the right to property, business, and legal protection. The provision of these rights is fundamental for the protection of the subjects of banking relations from illegal orders and orders. At the same time, the study revealed gaps and inconsistencies in the legislation regulating banking activities. Despite the presence of numerous normative legal acts, their imperfection creates conditions for the adoption of illegal orders and orders. Changes in the legislation are necessary to more clearly define the powers and responsibilities of state bodies and banking institutions.
2. A detailed study of the impact of regulatory mechanisms on violations in the banking sector allowed us to conclude that the existing mechanisms for protecting the rights of subjects of banking relations, such as judicial protection and control by the National Bank of Ukraine, are not always effective. This is due to lengthy procedures, insufficient independence of the judicial system, and limited opportunities for prompt response to illegal actions. The main reasons for illegal orders and orders in the banking sector are abuse of power, insufficient control and supervision, as well as political influence. These factors undermine confidence in the banking system and negatively affect its stability.
3. The method of analysis and forecasting helped to establish that international standards and practice play an important role in improving the legal regulation of banking activities. The implementation of these standards can help increase the level of law enforcement and protection of the rights of subjects of banking relations in Ukraine.

Based on the conducted research, recommendations were developed for improving the legal regulation of banking activities:

- Elimination of gaps and inconsistencies in the legal framework.
- Strengthening control and supervision of the activities of banks and state bodies.
- Improvement of mechanisms for protecting the rights of subjects of banking relations,

including the development of special procedures for quick response to illegal actions.

- Borrowing and implementing the best international practices and standards.

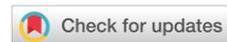
Therefore, the results of the study emphasize the need for systematic changes in the legal regulation of banking activities to ensure legality and law and order. Implementation of the proposed recommendations will contribute to increasing the legal protection of subjects of banking relations, strengthening the stability of the banking system, and increasing trust in it. The study of illegal orders and orders in the field of the banking system from the constitutional aspect showed the need to improve the legislative framework, strengthen control and supervision, as well as introduce effective mechanisms for the protection of the rights of subjects of banking relations. Implementation of international standards and best practices can significantly improve the situation in the banking sector of Ukraine. This will help increase the legal protection of citizens and legal entities and strengthen the economic stability of the state.

As for further scientific research, we consider it necessary to focus on the study of the practice of the Constitutional Court of Ukraine regarding appeals against illegal orders and orders in the banking sector.

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## The role of psychology in the formation of emotional intelligence in Ukrainian education

### Роль психології у формуванні емоційного інтелекту в українському освітньому контексті

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#### Abstract

Emotional intelligence is an important ability of a person that affects his development throughout his life. Therefore, the modern education system should focus on the formation of specialists with a high level of social and emotional skills. The purpose of this study is to characterize the importance of individual psychological methods in the development of emotional intelligence within the framework of modern Ukrainian education. For this, such methods as content analysis of literature, synthesis, generalization and comparison were used. On the basis of a critical approach to the selection of sources, relevant literature was selected for the study of this problem. The results showed that psychologists play an important role in the formation of social-emotional skills in the Ukrainian educational space. In particular, with the help of individual and group consultations, they contribute to the formation of emotion management skills in

#### Анотація

Емоційний інтелект - важлива здатність людини, яка впливає на її розвиток протягом усього життя. Тому сучасна система освіти повинна орієнтуватися на формування фахівців з високим рівнем соціально-емоційних навичок. Мета цього дослідження - охарактеризувати значення окремих психологічних методів у розвитку емоційного інтелекту в рамках сучасної української освіти. Для цього були використані такі методи, як контент-аналіз літератури, синтез, узагальнення та порівняння. На основі критичного підходу до відбору джерел було відібрано релевантну літературу для дослідження даної проблеми. Результати показали, що в українському освітньому просторі важливу роль у формуванні соціально-емоційних навичок відіграють психологи. Зокрема, за допомогою індивідуальних та групових консультацій вони

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modern students of education. The conclusions emphasize the importance of the role of psychology and its methods in the formation of the emotional intelligence of modern education seekers. In particular, it has been determined that such psychological methods as the training of sensations, self-regulation, techniques for the development of empathy, behavioral-cognitive therapy contribute to the formation of stable emotional intelligence.

**Keywords:** psychological support, development of emotional intelligence, pedagogical methods, emotional literacy, Ukrainian education.

## Introduction

An emotional state is a variable mental phenomenon that can range from positive to negative. A person is often unable to understand the reasons for such changes. Physical condition, moral feeling, changes in the external environment, the impact of conflicts, and rest can subjectively affect a person's state. Thus, emotions are always subjective, but they do affect a person's behaviour. For this reason, it is important to determine the importance of certain psychological methods of forming emotional skills in the Ukrainian education system.

At the same time, modern works have determined that emotions significantly affect a person's life, occupy them, influence their life and interpersonal relationships, and therefore are especially valuable for the cognitive and professional activities of any person. In this context, emotional intelligence (EI) plays a central role (Kotyk & Shkleda, 2023; Kao & Chen, 2016).

The capacity to identify, control, and make efficient use of emotions is known as emotional intelligence. High stress or anxiety levels in students might make it difficult for them to focus and remember material. For instance, a student experiencing test anxiety may find it difficult to concentrate during study sessions, which could result in subpar performance on the test.

Taking into account the current trends in the formation and development of the psychology of emotional intelligence, current scholars have focused on the problem of substantiating its axiological potential, which is carried out in the value and goal space of a person's life (Chebykin, 2023).

сприяють формуванню навичок управління емоціями у сучасних здобувачів освіти. У висновках підкреслено важливість ролі психології та її методів у формуванні емоційного інтелекту сучасних здобувачів освіти. Зокрема, визначено, що такі психологічні методи, як тренінг відчуттів, саморегуляція, техніки розвитку емпатії, поведінково-когнітивна терапія сприяють формуванню стійкого емоційного інтелекту.

**Ключові слова:** психологічна підтримка, розвиток емоційного інтелекту, педагогічні методи, емоційна грамотність, українська освіта.

At the same time, modern studies have substantiated certain methodological prerequisites for the conceptualisation of emotional intelligence from the standpoint of neuropsychology and the newest area of psychological practice - positive psychotherapy (Fedorchenko et al., 2022; Gren & Kirsanov, 2023). These aspects demonstrate that this problem remains relevant and important for further research. For this reason, the purpose of the study is to analyse the role of psychology in the development of emotional intelligence in the Ukrainian educational environment. Hence, in order to research this problem key objectives of this analysis include:

1. Theoretical study of the phenomenon of emotional intelligence on the example of individual psychological Works.
2. Characteristics of approaches to the formation of socio-emotional intelligence in the Ukrainian education system.
3. Determining the role of psychology and individual psychological methods in the system of emotional skills development.

## Literature Review

Modern scholars have developed various methodological approaches to the study of the phenomenon of emotional intelligence. Arias-Pastor, Van Vaerenbergh, Fernández-Solana & González-Bernal (2023) determined that EI is a necessary part of the training of modern teachers, the development of this quality builds resilience to changes in the learning environment. Ishii, Komatsu, Endo, Muto & Tonegawa (2017) investigated the main components of EI, described the main dimensions and how to define it. Mayer, Caruso, Sitarenios & Escobar (2024) also described the

problem of defining emotional intelligence. Koh & O'Higgins (2018) demonstrated that EI has a significant impact on leadership development. Moreover, Mikulic (2015) did emotional intelligence assessments in the educational, legal and health contexts. Moreover, Menéndez Álvarez hevia (2018) investigate the critical approach to emotional intelligence as a dominant discourse in the system of modern education.

According to Gren & Kirsanov (2023), when training future social workers, the main focus should be on the formation of a high level of emotional intelligence. The authors explain that a future social worker must adhere to the norms of business civilized ethics, a socially responsible citizen through the humanization of education and, as a result, it is possible to increase the moral and emotional level during his/her formation. Therefore, it is especially important to develop resilience to change in emotional terms (Gren & Kirsanov, 2023). At the same time, according to other studies, emotional intelligence is important in the formation of doctors, as they must both

understand the patient's emotions and remain tolerant towards them (Fedorchenko et al., 2022). In current research, important attention is paid to the theoretical explanation of the phenomenon of emotional intelligence, especially through the prism of educational and psychological studies. In particular, in the concepts of Chiorcea & Cioranu (2021), emotional intelligence is presented as a set of abilities that allow you to understand your own and other people's emotions, and therefore skilfully manage them. At the same time, according to other scholars, emotional intelligence is a stable mental quality, part of mental abilities. Some authors also see it as a substructure of social intelligence. As a mental ability, emotional intelligence is part of a broader group of personality traits (Kao & Chen, 2016). For this reason, it can be concluded that there is currently no single generally accepted term 'emotional intelligence'. However, based on the literature analysis, we can characterise important approaches to its research and understanding. In particular, we can distinguish three separate approaches to the interpretation of this concept.

**Table 1.**  
*General approaches the interpretation of EI*

Approach 1	Cognitive skills and emotion-related abilities
Approach 2	A collection of cognitive abilities and personality and behavioural characteristics
Approach 3	Non-cognitive ways of cognition and exploration of the surrounding reality
Summary approach	Integration of emotional intelligence with social and relational dynamic.

Source: Author's development

The majority of authors support the first approach, so the authors of this article are also based on the first approach to explaining EI (cognitive ability related to emotions). In general, modern scholars have focused on analysing the role and peculiarities of emotional intelligence for primary or secondary school students. Babiak, Sytnik, Zharovska, Kondratyeva, Smokova & Varnava (2023) identified the main components of the formation and development of emotional intelligence for school students. At the same time, Chebykin (2023) presented an empirical study of the emotional development of modern students. According to Kotyk & Shkleda (2023), the development of emotional intelligence is important in view of modern challenges, and both teachers and parents should pay attention to it from an early age.

Thus, modern scientists have proven that emotional intelligence plays an vital role in the

development of personality. However, some studies have focused on specific practical dimensions of emotional intelligence advance in the process of becoming a doctor, teacher, manager or social worker. However, few have addressed this issue comprehensively. Therefore, the authors of this study will try to take a comprehensive approach to this work and systematise the previous results of scientists, which will determine the novelty of this study. In addition, based on the literature review, there are not many studies that have explored the role of psychology in the formation of EI. Although many of them have formed the theoretical and methodological basis of the study, not much attention has been paid to this problem. Therefore, this study will comprehensively approach the problem of determining the role of psychology in the formation of emotional intelligence in Ukrainian educational institutions.

## Methodology

The study of the role of psychology in the formation of emotional intelligence in educational institutions of Ukraine will be based on a qualitative research approach. Accordingly, the study was implemented in a phased and structured manner.

## Data collection

At this first stage, data were collected in modern scientific and metric databases (Google Scholar, Ebsco, Scopus). Key words were entered into these databases, including “emotional intelligence”, “education”, “psychology”, and “Ukraine”. Since a small number of papers were found due to geographical restrictions, it was decided to consider other papers without a geographical component. Therefore, the term “Ukraine” was removed from the search databases. A total of 211 materials were selected.

## Tools and procedure

After data collection, a preliminary literature review was conducted. The main data of each paper were entered into an Excel spreadsheet: year of publication, abstract, keywords, and conclusions. Based on this, those papers older than 2016 were excluded. However, this criterion did not apply to fundamental and methodologically important works. Also excluded were those studies that did not relate to the educational system. Thus, 81 items were selected.

After this stage, the following inclusion criteria were formed:

1. The study deals with the theoretical foundations of emotional intelligence.
2. The importance of emotional intelligence in Ukrainian (or global) education is described.
3. The paper describes the source base of the study.
4. The methodology is clearly defined.

Following these criteria, 33 items of the most relevant literature to this study were selected.

## Data analysis

The method of content analysis of the selected materials was used in the study. Using the Exel software, indicators such as the main results, opinions, were entered into tables. After that, the

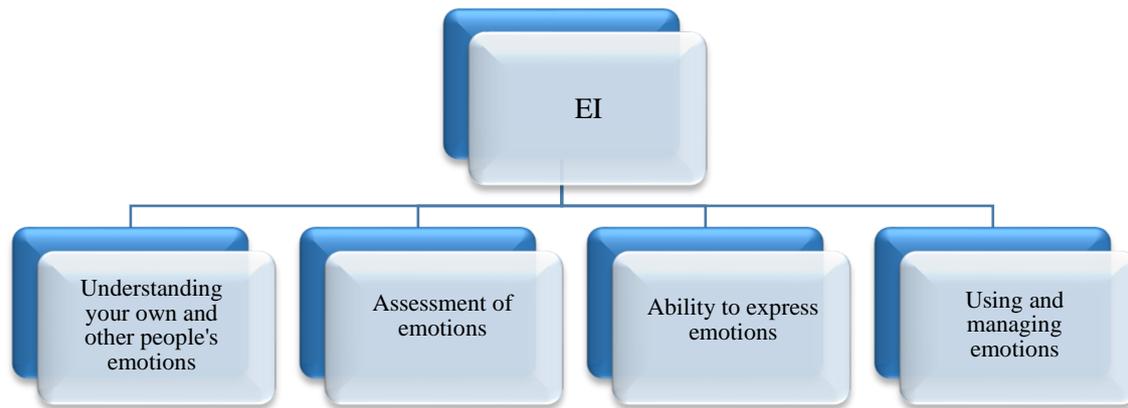
main components of emotional intelligence were identified. Thus, on the basis of content analysis, the main trends in the development of emotional intelligence were outlined, and its main components were identified. The synthesis allowed us to combine the data and outline the importance of psychological instruments. The comparative method was important in comparing the results obtained with the views presented in other contemporary selected works.

Several steps were taken to guarantee the quality and dependability of the content analysis in this investigation. Take the triangulation approach, for example. This required cross-checking and validating results utilizing a variety of data sources and researchers. The authors made sure that conclusions are solid and independent of a particular approach by comparing data from many sources or approaches. Additionally, the content analysis procedure was pilot tested by the article's writers, which helped to find problems with the coding scheme and guarantee that it appropriately captured the phenomenon of interest.

A number of biases could affect the study, such as selection bias, which would cause the sample to not be representative of the general population. Additionally, the study's conclusions might not be generalizable beyond the specific context in which the research was conducted.

## Results

The tradition of studying emotional intelligence as an important type of intelligence begins with the study of intelligence as a general mental ability aimed at successful adaptation of a person to the process of solving complex problems and new life tasks. In the field of psychology, intelligence has been studied within the framework of genetic, phenomenological, regulatory and structural-functional approaches. The latter formed the basis of a characteristic conceptualisation of its system, functions, and later types. The fundamental ideas of the phenomenon of EI were formed in the concept of Mayer, Di Paolo & Salovey (1990). These authors believed that emotional intelligence is the awareness and understanding of both personal and other people's emotions. At the same time, they explained that this phenomenon is a person's ability to perceive emotions in ambiguous cases and situations. Thus, they proposed a four-component system for developing emotional intelligence (see Figure 1).



**Figure 1.** Four components of emotional intelligence.

Source: Mayer, Di Paolo & Salovey (1990)

Given the current trends in education, the Ukrainian education system now recognizes the importance of developing emotional intelligence for students of different specialties and profiles. Modern approaches to Ukrainian education involve a transition from the traditional form of knowledge acquisition, where the teacher plays an important function and role, to classes where all participants in the learning process play an equally important role (Kuzheliev et al., 2023). This is especially true in integrated forms of learning, where pair or group work, discussions, brainstorming, and role-playing games come to the fore.

Such interactive activities contribute to the development of communication skills, conflict competence (easy and quick resolution of conflict situations), humanitarian thinking, which are necessary for the adaptation of the student to the challenges of modernity and in solving certain social problems (Mikulic, 2015). It has been proven that students with a high level of communication skills find a quick solution to a problem and cope with any complex tasks much faster than those with a low level of communication competence (Malik, 2021). Also, such students have fewer difficulties in adapting to new learning environments.

At the same time, students with low communication skills get lost in a situation of communication in seminars or practical classes, may not be able to cope with their emotions, and have difficulty concentrating. This, in turn, significantly slows down the process of acquiring new knowledge and skills. On the contrary, those

students who are able to manage their emotional state are more likely to start communicating on various educational topics and engage in various educational discussions. Modern scientists prove that the ability to control oneself allows you to make your speech coherent, emotionally attractive, clear, logical, and helps to avoid communication errors and unnecessary gestures. As mentioned above, having emotional intelligence also implies the ability to manage the emotions of other people; students with high emotional intelligence attract the attention of others and study with confidence. Thus, they contribute to the audience listening to them with attention and interest (Menéndez Álvarez Hevia, 2018).

Therefore, modern Ukrainian educational institutions are introducing various interactive classes (in the form of conversations, discussions), in which not only academic material is important, but also social and emotional learning. In particular, the disciplines of mediation, communication, ethics, and the development of cooperation and collaboration are important in the Ukrainian education system (Skrypnyk et al., 2020). These disciplines may have different names and focus on different areas, but their goal is the same: to develop students' social and emotional skills. An important area of improvement in Ukrainian education is training for teachers. Such activities include the development of specific areas and teaching methods that influence the development of emotional intelligence. Table 2 summarises the main approaches to developing emotional intelligence in Ukrainian education.

**Table 2.**  
*Key approaches to developing emotional and social skills in Ukrainian education*

Approach	Description
Integrated classes	Cover not only the development of academic knowledge, but also social and emotional skills of students.
The use of innovative methods	The use of brainstorming, conversations, discussions and other modern methods helps students to express their thoughts, develop communication skills and, consequently, emotional intelligence.
Special classes	Special group classes, in particular in the form of art therapy, music therapy and other methods related to mediation, emotional competence, contribute to the formation of a high level of socio-emotional skills.
Trainings for teachers	To introduce modern teachers to the latest methods and techniques those promote the development of emotional intelligence.
Consultations with psychologists	Contemporary institutions provide opportunities for students to consult and communicate with psychologists who can provide support and advice on the development of emotional skills.

Source: Author's development

Thus, as can be seen from Table 2, in addition to special educational methods and approaches, working with a psychologist plays an important role in the development of emotional intelligence. Modern psychologists have a set of knowledge and skills necessary to support and develop emotional and social abilities. They can also participate in the creation of curricula that

will promote these abilities. In addition, psychologists can organise trainings for teachers and students in Ukrainian educational institutions to introduce the phenomenon of emotional intelligence. Table 3 outlines the main areas of work of psychologists in Ukrainian educational institutions on the development of socio-emotional skills.

**Table 3.**  
*The role of psychologists in the development of emotional intelligence in Ukrainian education*

Role	Description
Participation in the development of programmes	Participation in the development of educational programmes, including components that promote the development of emotional intelligence.
Organisation of trainings for teachers	Psychologists conduct trainings that help to introduce the phenomenon of emotional intelligence, as well as its formation and development.
Individual and group counselling	Individual and group counselling for students to help them develop their communication, social and emotional skills.
Monitoring	Psychologists evaluate the results of social and emotional skills development programmes. They study the impact of individual techniques on the emotional state of students.
Ongoing psychological support	In Ukrainian educational institutions, psychologists provide ongoing, stable psychological support to students with social or emotional problems.

Source: Author's development

Consequently, the role of psychologists in the development of socio-emotional skills is multifaceted; they can both contribute to the development of curricula, monitor results, and provide individual or group psychological counselling.

Besides, there are many psychological methods that contribute to the development of socio-emotional skills. These methods can be used both by psychologists and teachers in the classroom (see Figure 2).



**Figure 2.** Psychological methods that contribute to the development of socio-emotional skills

Source: Author's development

In particular, methods of training the senses are important. For example, the 'rose-coloured glasses' exercise, where students need to name only the good qualities of other applicants. Such exercises contribute to the development of both their own emotions and understanding of the emotional state of other students. At the same time, self-regulation techniques are important. They can include breathing exercises, visualisation, meditation, which help to reduce stress and therefore control emotions (Hasiuk et al., 2022).

It has also been proven that self-regulation techniques help to increase students' concentration and form a stable emotional state. There are also separate methods for developing empathy. Such methods include various role-playing games, discussions, and discussions of emotionally difficult cases. Thus, the development of empathy is aimed at developing the ability to correlate one's emotions and understand the emotional state of others.

Another important area is the development of social skills (Pozo-Rico et al., 2023; Vostrotin & Litovchenko, 2023). With the help of modern methods of active learning, active listening, and conflict resolution methods, important skills are formed that contribute to the growth of a stable emotional component. Another important method is therapy through various types of art (in particular, music, art, and theatre therapy). As a result of the creative process, students learn to

express and manage their emotional state. At the same time, cognitive behavioural therapy is also important, based on the fact that human thoughts influence behaviour and emotions. Therefore, using certain methods, students learn to think positively and be confident in their statements and actions (Mercader-Rubio et al., 2023). In this system, relaxation techniques are important, including the use of calming methods, such as deep breathing, muscle therapies. They help to reduce stress, anxiety and understanding of the body.

## Discussion

### *Comparison of the obtained results with the works of other scientists*

This study has demonstrated that in the modern Ukrainian education system, the expansion of soft skills, in particular socio-emotional skills, plays an important role. Such traits as empathy, stress resistance, creativity, communication, cooperation, and curiosity are defined in the modern scientific literature as soft skills (or socio-emotional skills). Contemporary scholars, such as Vijayalatha (2019) and Yasien (2016), interpret them as abilities for effective adult life, as they are important in many areas. In particular, in the context of education, these are academic performance and learning outcomes, and in adult life, the performance of various complex and emotionally challenging tasks.

Thus, it has been proven that modern emotional skills enhance resilience, improve mental health, and promote social cohesion and cooperation. They are especially important in the training of specialists such as teachers, doctors, social workers, military personnel, etc. This is reflected in contemporary works. In particular, Arias-Pastor, Van Vaerenbergh, Fernández-Solana & González-Bernal (2023) found that emotional intelligence is an important skill for modern teachers, as those who have it are more adaptive and stress-resistant. At the same time, Gren & Kirsanov (2023) believe that when training future social workers, the focus should be on rising a high level of emotional intelligence, as the future specialist must adhere to the norms of business ethics, be a socially responsible citizen and have a high level of stress resistance.

At the same time, other scientists emphasise that emotional intelligence is important in the training of doctors, as they must control both their own emotions and those of patients. At the same time, they must remain stress-resistant in any situation (Fedorchenko et al., 2022). At the same time, this work has demonstrated that the advance of EI is important in the training of any specialist, as people use emotional skills every day. The modern globalised world is transforming rapidly, and a large number of people will need not only to change their retraining and profession, but also to build up new skills that can become an integral part of a person's qualification (Filipova et al., 2021; Kubiv et al., 2020; Shpykuljak & Mazur, 2014). This aspect is also emphasised by other scholars.

Thus, this article emphasises the important role of psychology in the progress of socio-emotional skills in modern Ukrainian education. It is proved that modern programmes contribute to the development of emotional intelligence in students, and thus develop their communicative and emotional competence. Modern scholars also recognise the importance of certain psychological methods in maintaining emotional stability (Babiak et al., 2023). Certain psychological methods, such as emotional development, communication, and socialisation training, help to manage one's emotional state.

At the same time, they enable students to use and manage their emotions more effectively both in their studies and in personal situations. However, some studies also emphasise the importance of other disciplines in the system of developing socio-emotional skills. In particular, artistic techniques play an important role in this process. The study by Dobrovolska, Moroz, Shpak,

Tsekhmister & Vovchenko (2021) used discriminant analysis to determine which indicators are important for the level of emotional intelligence development. According to the authors, the most important factors that form emotional learners are broad humanistic, prosocial, altruistic motives, interpersonal communication, and so on. In addition, the home environment, educational environments, cultural backgrounds, and socioeconomic status are only a few of the contextual elements that have a substantial impact on the development of emotional intelligence. These elements influence how people view, understand, and deal with their own and other people's emotions.

At the same time, prosocial motivation is multidimensional, and its presence emphasises the tendency to help others. Caring for others also implies understanding the needs of others, which also requires a high level of emotional skills. Therefore, the development of emotional intelligence is multifaceted, but psychological methods help to make its formation more effective and stable. Modern scholars also emphasise that the use of modern interactive teaching methods contributes to the development of social skills and makes learning more effective (Bobro, 2024). The researchers determined that the use of modern digital technologies contributes to more effective learning. This is also demonstrated in other works, in particular, Sanakuiev (2022) describes the role of artificial intelligence in the modern education system. The importance of using modern digital technologies, including augmented reality, is also emphasised by other reputable scholars (Tsekhmister et al., 2021; Tsekhmister et al., 2022a; Tsekhmister et al., 2022b). In general, modern works emphasise the importance of using artificial intelligence in the system of training modern specialists.

#### *Limitations and prospects for future research*

A number of biases could affect the study, such as selection bias, which would cause the sample to not be representative of the general population. Additionally, the study's conclusions might not be generalizable beyond the specific context in which the research was conducted.

However, as can be seen from the discussion, the main limitations of this study lie in its narrow perspective. Therefore, future research should focus on an interdisciplinary approach and characterise the role of different disciplines in the formation of emotional intelligence. At the same time, an important further direction is to highlight the effectiveness of individual

programmes in developing students' emotional skills through a special empirical study. These aspects will require a broad discussion of the results, and this paper only opens up many issues that will require further coverage.

### Conclusions

Hence, the Ukrainian education system focuses not only on the development of hard skills, but also on the development of certain soft skills (i.e. socio-emotional skills). In this system, an important role is played by the formation of emotional intelligence, which is developed within Ukrainian education with the help of special psychological methods and approaches.

The study found that methods of training feelings, self-regulation, empathy development techniques, and behavioral cognitive therapy contribute to the formation of stable emotional intelligence. Pedagogical methods that facilitate the implementation of these psychological approaches include conversations (both group and individual), brainstorming, discussions, visualisations, discussions of emotionally difficult situations, debates, etc. Another important area is the development of social skills. With the help of modern methods of active learning, active listening, and conflict resolution, important skills are formed that contribute to the development of a stable emotional component.

However, as the debate makes clear, this study's primary flaws stem from its limited scope. Future studies should thus adopt an interdisciplinary perspective and characterize the distinct roles that other disciplines play in the development of emotional intelligence. Simultaneously, a significant avenue for future research is to demonstrate, via a unique empirical investigation, how successful individual programs are in helping students enhance their emotional intelligence. These features necessitate a thorough analysis of the findings, and this work merely touches on a large number of the issues that will need more attention. However, this study has also shown that an important area for further study, and therefore for wider discussion, is the study of the role of other disciplines in the system of emotional intelligence formation in the modern Ukrainian education.

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## The role of art in the social integration of refugees in multicultural societies

### O papel da arte na integração social dos refugiados em sociedades multiculturais

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#### Abstract

This study aim was to focuses on the interaction of cultural and social factors in a multicultural society, with a particular emphasis on the role of art in promoting social integration. Through the analysis of social reality and the study of the socio-structural function of art, this research explores the challenges faced by different cultural groups in adapting to a diverse society. This study focuses on the interaction of cultural and social factors in multicultural societies, with a particular emphasis on the role of art in promoting social integration. By analyzing social reality and the socio-structural function of art, this research explores the challenges faced by different cultural groups, especially refugees, in adapting to a diverse society. The methodology employed in this work involved studying the problems of ethnic mosaic and multicomunitarianism, developing projects for multinational classes, and enhancing interpersonal skills for teachers working with refugees, with the help of a deep literature review from SCOPUS, Google scholar and Research

#### Resumo

O objetivo deste estudo foi focar na interação de fatores culturais e sociais em uma sociedade multicultural, com ênfase no papel da arte na promoção da integração social. Através da análise da realidade social e do estudo da função sócio-estrutural da arte, esta pesquisa explora os desafios enfrentados por diferentes grupos culturais na adaptação a uma sociedade diversificada. Este estudo centra-se na interação de factores culturais e sociais em sociedades multiculturais, com uma ênfase particular no papel da arte na promoção da integração social. Ao analisar a realidade social e a função socio-estrutural da arte, esta investigação explora os desafios enfrentados por diferentes grupos culturais, especialmente os refugiados, na adaptação a uma sociedade diversificada. A metodologia empregada neste trabalho envolveu estudar os problemas do mosaico étnico e do multicomunitarismo, desenvolvendo projetos para aulas multinacionais e aprimorando habilidades interpessoais para professores que trabalham com refugiados, com a ajuda de uma revisão bibliográfica profunda das bases de dados

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Gate data bases. The results indicate that the formation of different identities within multicultural communities poses challenges to successful integration. The scientific novelty of this study lies in emphasizing the importance of art as a tool for assimilation and integration in a multicultural environment. By providing a platform for self-expression and resilience-building for young refugees, artistic practices play a crucial role in fostering mutual understanding and tolerance among diverse cultural groups. In conclusion, this research underscores the significance of promoting positive changes in multicultural societies through art and highlights the need for continued exploration of strategies that support the integration and coexistence of diverse cultures.

**Keywords:** Intercultural interaction, Social integration, Cultural diversification, Art globalization, Identity.

## Introduction

It is imperative to outline the primary focus of the study and the authors' scientific viewpoint. The study aimed to shed light on the impact of multiculturalism on children and adolescents forced to flee war, particularly in terms of their adaptation and integration into new societies through the use of art. This group represents a diverse range of ethnic backgrounds and needs, presenting a complex challenge for society to address. The research aims to address gaps in support currently available to these young individuals, including resources for adaptation, knowledge on the potential of art in integration, and the consideration of ethno-cultural diversity in educational settings. This analysis aims to deepen our understanding of multiculturalism and the role of culture in the integration of refugee children.

One of the most important characteristics of our time is the crisis of culture, which manifests itself in the hypertrophic production of content, which prevents individuals from forming a subjective culture. Today, however, the issue of culture is different. In the context of the war in Ukraine and the phenomena of migration, modern societies are moving towards creating a world where a set of reference cultures is being formed. In this paper, this issue is considered in the context of a broader discussion of "multiculturalism". Children and adolescents who have been forced to flee war are undergoing significant transformations, living in extremely unstable conditions, unable to read and write, and unable

to learn the language of the host country. They are completely defenceless and find themselves in a difficult situation. They have not yet lost their own self-identity, but they are confronted with a new culture.

SCOPUS, Google Scholar e Research Gate. Os resultados indicam que a formação de identidades diferentes dentro de comunidades multiculturais representa desafios para a integração bem-sucedida. A novidade científica deste estudo reside em enfatizar a importância da arte como uma ferramenta de assimilação e integração em um ambiente multicultural. Ao fornecer uma plataforma para a autoexpressão e construção de resiliência para jovens refugiados, práticas artísticas desempenham um papel crucial na promoção da compreensão mútua e tolerância entre diversos grupos culturais. Em conclusão, esta pesquisa destaca a importância de promover mudanças positivas em sociedades multiculturais através da arte e destaca a necessidade de explorar continuamente estratégias que apoiem a integração e coexistência de culturas diversas.

**Palavras-chave:** Interação intercultural. Integração social. Diversificação cultural. Globalização da arte. Identidade.

The paper examines the social dynamics of multiculturalism through the use of art to aid in the integration of refugee children from Ukraine into host societies. These children come from diverse ethnic backgrounds and have unique needs, making their integration a complex process that requires coordinated efforts across all sectors of society. By exploring the concept of multiculturalism and defining culture scientifically, the paper aims to address gaps in current support for immigrant youth in Ukraine. These include a lack of resources for adaptation, a lack of understanding of the potential of art in integration, and the challenge of accommodating ethno-cultural diversity in educational settings for refugee children.

The primary focus of this study is to investigate the impact of multiculturalism on children and adolescents who have been forced to flee war, with a particular emphasis on their adaptation and integration into new societies through the use of art. This group represents a diverse range of ethnic backgrounds and needs, presenting a complex challenge for society to address. The research aims to shed light on gaps in support currently available to these young individuals, including resources for adaptation, knowledge on

the potential of art in integration, and the consideration of ethno-cultural diversity in educational settings.

The literature review examined previous research on the role of art in social integration.

The methodology section described the qualitative approach and data collection methods used in this study. To assess social integration, the study used the following indicators: engagement levels and frequency of participation in local art-related events and communal activities, the number and strength of interpersonal connections formed through art activities, how participants express and maintain their cultural identities through art.

The results section presented the key findings of the study and their discussion. In the discussion, the findings were interpreted in the context of the broader literature. This section analysed related the study's findings to existing research on art and social integration. The conclusion summarised the main points of the study and underscored the significance of promoting positive changes in multicultural societies through art.

### **Theoretical framework and literature review**

The transformation of modern societies is testing the meaning of concepts that attempt to understand their complexity. This poses new challenges to sociology and triggers public debate. The stability of political institutions in modern societies in the fight against the risks arising from the uncontrolled evolution of cultural pluralism is the subject of numerous scientific works. Thus, the problem of the normative foundations of societies, in particular the issue of "reference cultures", is becoming increasingly relevant.

According to the findings of Lengel, Mechehoud, & Newsom (2022), there is a rise in modes of association in various spheres of society that question the possibility of a common normative orientation. This has led to discussions about "transnormative" processes of association in the social sciences (Dodu-Savca & Ernu, 2022). The creation of a common normative framework often encounters limitations, especially when it is based on ethical, political or religious values, i.e. on a common cultural heritage. However, the institutional structure of society is better preserved than social theory suggests, which points to problematic aspects of legitimization procedures. These procedures are based on

"intercultural modalities" of consensus (Fuchs & Von Scheve, 2023), and contexts of legal validity are established despite the absence of shared cultural value.

Sociology's theoretical orientation towards biological metaphors can be based on the observation that living systems are composed of dynamic rather than static structures. Living organisms ensure their autonomy, autonomy, regulation, and repair through the rhythmic implementation of their structural characteristics necessary for survival (Go, 2023). Instead of the mechanical idea that social structures are immutable after the process of institutionalisation and socialisation, we need to consider their constant renewal in the context of everyday action. Thus, transnormative forms of association that emerge in routine, legal norms and power relations become the main object of sociological analysis (Ritzer & Stepnisky, 2021).

With the development of complex societies, the fragmentation of culture has become a more relevant topic for discussion. We try to use political semantics to reduce the impact of new social phenomena on this process. The topic of migration is pivotal in these discussions and bears significant consequences. It's noteworthy that immigration emerged as a defining feature of developed societies during the latter half of the 19th century (Favell, 2022).

The conditions of war in Ukraine today are leading to an increase in the size of the migration problem, which is becoming more urgent than ever before (Senchylo-Tatlilioglu et al., 2023). This situation raises the concern that the most developed countries are forced to adapt to a new global order where their leadership position may be in question. It also raises concerns about foreigners staying on their territory (Carling & Collins, 2018). On the other hand, modern societies are undergoing an evolution where minorities, whether ethnic or not, are actively maintaining their identity and cultural diversity. This process represents one of the main challenges in the development of multiculturalism. According to Ramos, Pereira & Vala (2020), analyses of the implementation of multiculturalism, as sometimes happens in public debates, are complex. There are different models of "cultural diversity" that are worth considering understanding this concept. For example, a distinction is made between "multinational" and "polyethnic" states. In the case of Europe, it still faces a limited migration flow, as indigenous groups remain in the countries in large numbers. Despite some resentment, the former colonial

powers maintained policies that provided migrants with comprehensive assistance, beyond language courses. Recent developments, however, have been characterised by the phenomenon of forced migration, which is usually accompanied by a lack of proven language skills. In this respect, the cases of Germany and Italy are striking in the exemplary value of their opposition (Dancygier & Margalit, 2019).

According to Botvyn., Aleksandrova., Krymets., Dobrovol'ska., & Rudenko (2022), ethnic groups have a structurally weaker status than national minorities because they are not linked to a specific territory that they have occupied for a long time. They participate in the political institutions of the dominant culture and speak its language. Therefore, they should not be considered as "nations" because, while opposing assimilation, they do not demand the creation of a parallel society, as national ethnic minorities do. They are, according to Mosendz, Filimonova-Zlatohurska, Pankiv, Bannikova, & Vlasiuk (2022), loosely united subcultures that speak an indigenous language while being characterised by different ethnicities. Finally, there are groups that straddle the line between ethnic minority and nationality, such as the "Latino community" in the United States (Lin, 2024). However, this denomination is more of a statistical category than a structured ethnic reality, given its fragmentation into different groups.

Following the observation of Dobrolyub'ska, Semko, Tytar, Yuhan, & Byedakova (2024), scholars are gradually abandoning the one-dimensional concept of multiculturalism, which is ambiguous, and introducing the difference between "multinationality" and "polyethnicity". The idea of multiculturalism is actually associated with the image of the complete disintegration of the entire indigenous culture, which does not correspond to the current reality, where "multicultural societies" are in maximum contact with the conditions of polyethnicity. framework of the dominant national institutions of the indigenous population.

Therefore, analytically, the paper can consider the internal differentiation of culture or use this word to refer to the sum of cultural aspects common to a society. Clarifying the meaning of the concept of culture and the role it plays in the integration of modern societies is one of the main objectives of the present work. It is in this perspective that such a sociological theory of culture can make a significant contribution.

The changing landscape of modern societies is challenging traditional concepts and sparking important debates within sociology. The exploration of how political institutions navigate the complexities of cultural pluralism in today's multicultural society is gaining increasing interest in academic research. Understanding the concept of "reference cultures" and normative foundations within societies is a pivotal area of investigation.

Recent studies suggest that various modes of association in society are challenging the idea of a common normative orientation (Chifor, 2023). This has led to discussions about "transnormative" processes of association in social sciences (Corey, 2023). Despite the limitations faced in creating a common normative framework based on shared cultural heritage, societal institutions continue to uphold their structures through intercultural consensus.

As state Di Sabatino & Mastrantoni (2022) sociology's approach to society as dynamic living systems, rather than static entities, sheds light on the constant renewal of social structures through everyday actions. The emergence of transnormative forms of association, legal norms, and power dynamics are central to sociological analysis in modern society.

The fragmentation of culture and the impact of migration according to Dorren (2024) are pressing issues in contemporary discussions. The current conditions in Ukraine highlight the urgent nature of migration challenges faced by developed countries, raising concerns about their leadership roles. The evolution of modern societies towards embracing cultural diversity, while grappling with the complexities of multiculturalism, presents a significant challenge.

Ethnic groups and national minorities play distinct roles in society, with varying levels of integration and political participation. The concept of "multicultural societies" and the distinctions between "multinational" and "polyethnic" states are crucial for understanding cultural diversity in different contexts. The nuances of ethnic identities, national minorities, and forced migration underscore the complexities of multiculturalism and integration policies.

It is important to move beyond one-dimensional notions of multiculturalism and explore the concepts of "multinationality" and "polyethnicity" to better understand the

integration of diverse cultures within dominant national institutions. Clarifying the role of culture in modern societies and its implications for social integration is a key focus of ongoing sociological research.

Previous studies have focused on the challenges posed by cultural pluralism and the need for a common normative framework in modern societies. These studies have highlighted the limitations of relying on shared cultural values for normative foundations and have explored alternative forms of consensus building based on intercultural modalities. The focus has shifted towards understanding the dynamic nature of social structures and the constant renewal of norms and power relations in everyday actions.

The present study built upon these findings by delving deeper into the concept of transnormative processes of association and their impact on the stability of political institutions. By examining how these transnormative forms of association manifest in routine interactions, legal norms, and power relations, the study aimed to provide a more nuanced understanding of the normative foundations of societies in the face of cultural pluralism.

The literature review has informed the design and implementation of the study by highlighting the need to move beyond static conceptions of social structures and focus on their dynamic nature. By drawing on biological metaphors and emphasizing the rhythmic implementation of structural characteristics necessary for survival, the study seeks to capture the fluidity and adaptability of social norms and power relations in modern societies.

In summary, the present study addressed the gaps in previous research by focusing on transnormative forms of association and their implications for the stability of political institutions. By building upon existing literature and theory, the study aims to provide a deeper understanding of the normative foundations of societies in the context of cultural pluralism and ongoing societal transformation.

## Research design and methods

### General Background

This research aimed to analyse the sociostructural functions of art in the era of multiculturalism, focusing on the impact of arts projects on the adaptation and integration of young people from different cultures and

societies. The research drew upon an examination of relevant scientific literature encompassing cultural and social theories, aimed at comprehending the intricacies inherent in the discourse surrounding multiculturalism.

### Study Design

The study design involved a qualitative approach, utilising tools from cultural theory to analyse the social reality underlying the multiculturalism debate. The research also examined the problems associated with different typologies of multiethnic societies and the challenges of social integration faced by individuals in contemporary global societies. In the data analysis process, thematic analysis was used to code and categorize the data collected from interviews and literature review. Themes such as the role of arts in social integration, challenges faced in multicultural classrooms, and the impact of educators' support on young people's adaptation were identified and analysed.

### Data Collection

The data collection methods encompassed a comprehensive review of scholarly literature on cultural theory, primary texts, and secondary studies sourced from SCOPUS, Google Scholar, and ResearchGate. Furthermore, the research incorporated interviews with educators engaged with Ukrainian refugees, aiming to grasp the hurdles and achievements of arts initiatives in fostering adaptation and integration. To ensure the validity and reliability of the results, data triangulation was employed by combining findings from different sources such as literature review and interviews. Member checking was also conducted by presenting the findings to educators for feedback and validation. Additionally, peer debriefing was used to discuss and validate the interpretations of the data with other researchers.

### Validated instruments or tools

The study utilised validated instruments in cultural theory to analyze the impact of arts projects on social integration and adaptation. Interviews with educators are conducted using structured interview guides to gather specific information on the effectiveness of arts projects in multicultural classrooms. The study participants consisted of educators working with young people from different cultural backgrounds in multicultural classrooms. A total of 10 educators were selected based on their experience and involvement in arts projects

aimed at facilitating social integration and adaptation. Participants were primarily aged between 15-45 years, with a fairly equal distribution of gender. The educators represented various ethnicities and cultural backgrounds to provide diverse perspectives on the impact of arts projects on social integration.

### Data Analysis

The data analysis relied on the insights garnered from the literature review, interviews with educators, and examination of cultural and social theories. The study highlights the importance of arts in facilitating the adaptation and integration of young people from different cultures and societies. The analysis also emphasizes the significance of educators' interpersonal skills in working with young people from diverse backgrounds.

In essence, the research methodology integrated social theory and cultural theory to furnish a holistic comprehension of the role of arts within multicultural societies. The study emphasizes the importance of developing meaningful relationships with young people from different cultures and promoting creative spaces for self-expression. The research design combined qualitative methods with a focus on cultural and social theories to provide an in-depth analysis of the sociostructural functions of art in the era of multiculturalism. The study highlighted the importance of arts in promoting social integration and adaptation among young people from diverse cultures and societies, emphasizing the role of educators in facilitating this process.

## Results

### Culture and art as drivers of socio-structural integration

Culture is an important function for social inclusion through its influence on daily activities. In complex societies with functional differentiation, according to Chi & Belliveau (2022) the economy is recognized as a sphere of value or a social system, rather than the “foundation” of society. Given the processes of cultural fragmentation due to massive processes of refugee and emigration, the task of social integration becomes the responsibility of individuals who interact with each other. The crisis of culture and the rise of multiculturalism in modern societies pose challenges for individuals forming subjective cultures in a content-saturated world. The impact of migration on culture is shaping our modern societies. Such an interpretation can delve into the role of culture as a social institution, providing a reservoir of tools for achieving social integration. This perspective emphasizes the dynamic nature of culture, shaped by historical processes and societal changes.

As a social institution, “culture” creates a reservoir of tools for achieving social integration. Therefore, it can be seen as an anthropological constant that is formed in the connected lives of different historical periods due to the “natural artificiality” of the species. However, the evolution of modern societies has a significant impact on cultural dynamics. Hypotheses from cultural theory are rooted in a critical examination of this evolution towards social complexity as consequences of wars and migrations (fig. 1):



**Figure 1.** The world's refugee's crisis.  
Source: “Statista - the statistics portal” (2023)

In his work, Sydorenko (2024) considers culture in the context of acculturation of the individual personality. The objects of experience are selected from the natural environment and are subject to the will of the individual. Through interaction with cultural objects, in particular art,

the individual develops. However, the evolution of culture also means reification, when its products become objective “spheres of values” according to their own logic, which influences the formation of individuality (table 1):

**Table 1.**  
*Stages of the evolution of culture seen through reification*

The evolution itself	The evolution of culture begins with the development of societal norms, beliefs, and practices that are passed down through generations.
Culture involvement	As culture evolves, these norms and beliefs become solidified and ingrained in society, leading to the creation of tangible products such as art, literature, music, and architecture.
Spheres of values	These products of culture become reified, meaning they take on a life of their own and become objective “spheres of values” that influence the way individuals think, behave, and interact with the world around them.
The impact	This reification of cultural products has a profound impact on the formation of individuality, as individuals are shaped and influenced by the values and norms inherent in their cultural environment.
The reification itself	The progression of culture and the solidification of cultural artifacts are pivotal in shaping the identities and behaviors of individuals within a society.

Source: authors own design.

Therefore, culture can only be constituted by bypassing reified culture. To explain the conflict between the two lines of modern cultural progress, science uses opposing concepts: objective and subjective culture. The social differentiation of modernity goes beyond the classical process of acculturation. The exponential development of objective culture is not consistent with the evolution of the subjective culture of individuals. The growth of objective culture leads to qualitative changes, as the gap in the depth of its heritage becomes insurmountable for the formation of subjective culture. This is the essence of the “conflict of modern culture”. Thus, the socio-structural task of subjective culture is to integrate subjects into complex social systems, providing them with a common life experience. The conflict between objective and subjective culture highlights a key tension in modern societies. Objective culture, characterized by its exponential development, poses challenges for individuals in forming subjective cultural identities. This conflict underscores the need for a deeper understanding of how cultural dynamics impact social integration.

The findings can be linked to the research questions by exploring how migration influences cultural dynamics and social integration. Analyzing the effects of migration on subjective

cultural formation in the context of modern societies can provide insights into the challenges and opportunities for individuals interacting in multicultural environments.

The interplay between cultural and social factors is intricate. While culture can only be conveyed through specific manifestations, the proliferation of objective culture may impede the process of acculturation. Thus, as state Cahn, Ross, & Shapshay (2020), the conflict of contemporary culture stems from the contradiction between the needs of a society with diverse functions. The increasing distance between an individual and his or her living conditions requires an increasing number of symbolic forms that help preserve the substantive content of culture. These forms provide individuals with the means to integrate into society, but at the same time require them to combine fragments into a coherent synthesis with personal meaning. However, this synthesis and the maintenance of a society with diverse functions are becoming more difficult due to the rapid growth of objective culture. Yet, this paper aimed to examine the conflict between objective and subjective culture, and address how the growth of objective culture affects individuals' integration into complex social systems. This connection helped in directly answering research questions regarding the mechanisms through which culture facilitates social inclusion.

The study of artistic practices in a multicultural society is the first stage of diagnosing the crisis of contemporary culture. Currently, scholars are expanding on these observations, pointing out that the complexity of contemporary culture can hinder its development by closing in a state of déjà vu or refusing to reproduce forms (Holle et al., 2021). They believe that the cultural creativity of a society consists of two currents that interact with each other, creating a tension that leads to the evolution and rethinking of cultural values. Such a consideration of internal factors, such as individuals' cultural backgrounds and experiences, provide nuanced insights into how subjective cultures are formed and integrated within diverse social contexts. This exploration helps in understanding the diverse ways in which individuals navigate cultural complexities. When delving into the dynamics of artistic practices within a multicultural society, investigating the intersections of music and choreography unveils a rich tapestry of cultural exchange and expression. Music and choreography serve as vessels through which diverse cultural traditions, narratives, and identities are communicated and celebrated. This exploration not only sheds light on the artistic forms themselves but also provides insights into the social, historical, and political contexts in which they emerge and evolve. Moreover, studying the fusion of music and choreography in multicultural settings offers a deeper understanding of how communities negotiate their cultural heritage while embracing new influences, fostering connections across cultural boundaries, and promoting dialogue and understanding (Brannigan et al., 2023: 281). We agree that sociology should study contemporary socio-cultural phenomena without preconceptions about their future development. Thus, the diagnosis of cultural evolution reflects the possibilities of the future society.

The investigation into the role of art in facilitating the adaptation of refugees to new environments reveals that the cultural crisis can stem from the heightened cultural stress induced by migration processes. The analysis of external factors, including the social and political context, enables a deeper understanding of the broader structural forces shaping cultural dynamics and social integration. By examining how societal changes, such as wars and migrations, influence cultural evolution, the research can highlight the multifaceted nature of cultural adaptation. Thus, at the present stage, the dynamics of cultural transformation reflects the expansion of the Marxist concept of conflicts between cultures, which calls into question the possibility of

integration and adaptation of refugees into a new social environment (Favell, 2022).

However, art can be an effective tool to help refugee children assimilate into a new culture. It can help them to deal with emotional and psychological problems that arise from the difficult experience of migration. The arts can stimulate creativity and self-expression, facilitate communication and understanding of the new environment. Participation in music, dance or other artistic activities can help refugee children to connect with peers and other members of their new society and develop skills of cooperation and understanding. The arts can also help children feel more confident and settled in their new environment.

Thus, the development of artistic practices among refugee children can help them adapt to a new culture and facilitate their integration into the society where they are now.

Art as an assimilation tool for children of refugees from Ukraine

The use of different art forms for assimilation has many facets. Its therapeutic potential and ability to influence personal growth and social change are based on various concepts developed in psychology, art therapy and art education, among other fields. The use of art can vary depending on the context. Three aspects are considered here: the use of art as a therapeutic tool, art education aimed at young people, and the culture of young people that influences art education.

Potential possibilities of therapeutic art

The benefits of art practice are explored from an interdisciplinary perspective. The privileged creative approaches in this field (such as art, play, fairy tales and puppets) for working with children and adolescents are based, among other things, on the theoretical concepts of transitional space and transitional object developed by the paediatrician and psychoanalyst Donald Winnicott (Manolachi, 2021).

The scientist describes the existence of a transitory space, which is a transitional zone between external and internal reality. This space serves as a symbolic function, helping the individual to separate from the mother and manage anxiety. The transitory object located in this space is the first "non-self" for the child, and he or she uses it to meet his or her needs. This object helps the child to move to an objective perception of the world and explore it, gradually

losing its relevance. Adults will invest this space through different areas of life, such as religion, culture and art.

Thus, the hypothesis of the work is that art is an effective transitional object for the assimilation of refugee children. The purpose of using artistic techniques is to help young people from a migrant background express themselves, understand their losses and express their emotions about their migration experience. Understanding their lives or the consciousness of what they have experienced (e.g. in the case of war-related trauma, as in the case of refugees) is key to ensuring mental health.

The concept of resilience was originally used in the natural sciences but was later reclaimed in the

social sciences and is defined as “the ability to develop in the face of incredible hardship”. According to Mokline & Abdallah (2021), connection (with a significant other) and meaning are two necessary components for the resilience process to begin:

Resilience approaches include the use of creativity, art therapy and art education. A child who has experienced trauma can express his or her emotions and fears through symbolic drawing or playing with a puppet, which helps to build a dialogue between external reality and internal space. Art educators can also develop educational programmes aimed at supporting and developing resilience in children, especially in immigrant communities (Figure 2):



**Figure 2.** Motanka doll as art therapy for refugee children from Ukraine.  
Source: (Motanka, 2012)

Teaching art to young refugees is not only about providing a safe environment for their creativity, but it is also a way to help them express themselves and feel in control of their lives. The arts can be an important means of communication and expression for them, helping them to discover their new surroundings and gradually integrate into them (Kassan et al., 2020). It is important to remember that they may not have any experience with the arts, so it is important to offer them a variety of opportunities to create. The arts can stimulate their motivation and increase their self-esteem through the pleasure of learning. When they are creating, they do not feel like they are working, which makes learning more interesting and engaging for them (Quintero, 2024). Art practices can also help them discover new environments and gradually integrate into them. Additionally, music and choreography as art therapy encompasses various aspects such as emotional

expression through musical compositions and stress relief through listening to music as a relaxation tool. Music also stimulates creativity and social interaction through participation in musical processes and group projects, fostering the development of cognitive skills and self-expression for personal growth (Brannigan & Lawson, 2023: 281).

The educator should keep in mind that some young people may not have experience with different mediums and the results may look awkward. It is important to offer them a variety of opportunities and mediums so that they can create on their own.

In addition, art makes mistakes and even encourages them. They can lead children into unknown territories. The teacher can use this aspect to stimulate creative solutions. Although providing successes to these young people does

not solve all problems, it is still an important contribution that is available even with a language barrier.

The implications of these findings extend to social policy, emphasizing the importance of promoting cultural diversity and fostering inclusive environments. Addressing the challenges posed by the conflict of modern culture requires policy interventions that support individuals in navigating cultural complexities while preserving the substantive content of culture.

By integrating the theoretical framework with the research findings, the current interpretation offered a nuanced understanding of how culture influences social integration in modern societies. Establishing explicit connections to research questions and exploring both internal and external factors contribute to a comprehensive analysis of the implications of cultural dynamics on social cohesion.

### Discussion

To address these challenges and limitations, further research could focus on exploring the role of art in promoting intercultural dialogue and understanding. By studying how artistic practices can facilitate communication and collaboration between diverse cultural groups, researchers in their work identify effective strategies for promoting cultural integration and cohesion.

For example, the examination of artistic endeavors in a multicultural setting demands a thorough exploration of the interplay between cultural and social elements. Within this framework, Pinto & Pinto (2022) contend that it's crucial to acknowledge that multiculturalism doesn't inherently precipitate a cultural crisis; instead, it can foster multifaceted identities and cultural pluralism. Similarly, Barçin (2020), in a correlated investigation, concludes that multicultural societies like Canada or Belgium exemplify how varied cultures can coexist harmoniously and engage in diverse interactions, thereby mutually enriching one another.

On the other hand, the crisis of modern culture can be linked to the hypertrophy of objective culture, which can make it difficult to synthesise subjective culture and integrate people into social relations. According to Brondino & Greaney (2023), this can create problems for social integration and contribute to the phenomena of communitarianism. Thus, it is important to study not only the external manifestations of culture in

a multicultural society, but also their relationship with social processes and individual identity. Moreover, exploring the effects of art education and cultural programs on social integration could offer valuable insights into how these endeavors might mitigate cultural rifts and cultivate a collective sense of identity. By highlighting the benefits of cultural exchange and artistic expression in promoting social cohesion, researchers can provide valuable evidence to support the development of policies and programs that promote multicultural integration (Brannigan & Lawson, 2023).

As per Akkoyun & Uyar (2020), examining artistic endeavors in a multicultural society can present fresh avenues for comprehending the interplay between cultural and social dimensions, thereby fostering an appreciation for the diversity and distinctiveness of various cultures. In his similar study, the researcher notes that it is important to realise that multiculturalism does not threaten cultural identity but can enrich and strengthen the cultural heritage of society.

Today, as states Bendaş (2023), the process of forming stereotypical perceptions of others, which is an important part of sociology, can no longer provide a sufficient cultural context for the interaction of "members of the same society". As shown in our study, this leads to fragmentation of social ties, limitation of groups of different ethnic origins in conditions of limited identity practices that oppose each other. People feel the need to change their attitudes towards globalisation in their everyday activities. War that threatens lives, economic and social instability caused by the constant need to adapt to new challenges of social complexity seems to be triggering a crisis that will last for centuries. In this respect, Binder, Borné, Johnsdotter & Essén (2012). insist that it is important not to limit the integrative function of culture, to try to avoid social problems that arise from confrontation between cultural groups. Other communities according to Baker & Joselit (2022) feel the need to strengthen their identity by celebrating important aspects of their cultural heritage that may not have been as important in their original environment. Instead of working for exchange, cultural barriers between groups are strengthened on both sides. In this way, we try to protect ourselves from the social difficulties that arise from being uncomfortable with the presence of others in our daily lives. Furthermore, examining the representation of diversity and multiculturalism in art and media can shed light on how stereotypes and biases are perpetuated and challenged in artistic practices.

Through a critical examination of how diverse cultural groups are depicted in artistic creations, researchers can advance a more nuanced comprehension of multiculturalism, thereby fostering increased cultural diversity and inclusion within artistic endeavors.

A related study by Zabora, Kasianenko, Pashukova, Alforova, & Shmehelska (2023) demonstrates that in a multicultural environment, artistic practices have great potential to assimilate refugees arriving in new countries. Art can become a universal language that unites people regardless of their cultural background. Through a joint creative process, migrants can integrate into a new society, opening up new opportunities for communication and interaction. Indeed, from the perspective of the presented work, it can be argued that the presence of different cultural practices and traditions can enrich the artistic environment, making it more diverse and interesting. Art can act as a conduit connecting disparate segments of society, fostering mutual comprehension, tolerance, and collaborative support.

Baca (2023) asserts that art can wield significant influence in facilitating the integration of refugees into a novel environment. Through the joint creative process and interaction between different cultures, art can contribute to building a single, united society where each individual can feel part of the whole.

In modern societies, it is becoming increasingly difficult to construct images of other people, which leads to an increase in alienation between them. The speed of social exchanges increases the distance between people, and stereotypical images push them further apart. This leads to conflicts between different cultural groups competing for territory and identity (Sofilkanych et al., 2023). It is worth noting that attempts at ghettoisation and self-ghettoisation lead to conflicts between migrants and locals. Ideological conflicts often assume symbolic significance, exacerbating societal divisions along ethnic lines. Such circumstances can escalate into ethnic conflicts and, in extreme cases, civil unrest. Efforts to delineate clear distinctions between "allies and adversaries" can further polarize society into irreconcilable factions, hindering cultural integration and jeopardizing coexistence within a diverse society.

According to Ramos, Pereira & Vala (2020), in order to maintain the characteristics of functional differentiation, complex societies must integrate

beyond the identity of the different communities that make them up. Socio-structural factors encourage the unlocking of identity dynamics and overcoming resistance to communitarianism. The danger of ethnic civil war can only arise as a result of a dramatic regression to stratification. In his study, Favell (2022), explains that by disrupting the process of social identity formation between groups in a community, we can observe a regression to stratification within ethnic groups, which is detrimental to integration at the societal level. In this context Abrudan (2023) states important tensions that arise between three levels of social integration: individuals, intermediate groups and society as a whole. The conflicts that arise have a significant impact on the social fabric, and even if they do not lead to open struggle, they remain significant for the dynamics of multi-ethnic societies.

After mentioning the ethnic mosaic in the context of multicultural coexistence, it becomes possible to reveal the concepts of "multicommunitarianism". Mutual recognition between ethnic groups can be the basis for the effective integration of a multiethnic society, where each group has its own protected space for development while preserving its culture. However, according to Go (2023), this process may lead to the problem of marginalisation of migrants who find themselves locked in their ethnic community. The development of this problem according to Arnold (2023) may raise the question of the importance and role of institutions in modern society.

In this context, the findings of the presented study illustrate that artistic endeavors hold significance in facilitating the assimilation of refugees into a multicultural environment. Art can serve as a bridge between different ethnic groups, promoting mutual understanding, cooperation and exchange of cultural values. Exhibitions, concerts, theatre performances and other forms of art create opportunities for people to express their cultural heritage in a creative way, interact with others and form new identities.

By participating in art projects, refugees have the opportunity to discover new forms of expression, feel part of a new community and find their place in that community. Through art, they can build positive relationships with local people, share their stories and experiences through creativity.

Thus, it can be said that artistic practices play a key role in the process of assimilation of refugees in a multicultural environment, promoting their integration and mutual understanding between

different ethnic groups. Art allows for the creation of common ground, preservation of cultural identity, and the development of new forms of expression in a single cultural space.

Overall, by conducting research on the role of art in multicultural integration and addressing the challenges and limitations of cultural diversity, researchers can help advance knowledge and understanding in this important area, ultimately leading to more effective strategies for promoting social cohesion and cultural exchange in multicultural societies.

## Conclusion

The overarching conclusion drawn is that employing cultural theory in the examination of multicultural societies enhances our comprehension of the dynamics involved in the interplay between cultural and social factors. It is important to avoid simplifying cultural horizons and create conditions for the integration of various ethnic groups into society. At the same time, it is necessary to avoid the trap of "multicommunitarianism", where individuals remain in their own ethnic communities without the opportunity to integrate into the diversity of society. An extension of this debate could be to find ways to promote integration and diversity in a multicultural society while preserving individual and cultural identity.

Thus, these findings significantly contributed to existing knowledge about the role of art in social integration within multicultural contexts by applying cultural theory. The study highlighted the complexity of cultural dynamics and their interaction with social factors, emphasizing the need to avoid oversimplification of cultural horizons. By exploring how individuals from various ethnic groups interact within multicultural societies, the research enriched theoretical understandings of cultural adaptation and integration processes. One theoretical model that could be used or adapted in the context of multicultural societies is the Multicultural Competence Framework. This framework emphasizes the importance of developing skills and knowledge to effectively navigate and work within diverse cultural environments. By implementing this framework in educational institutions, workplaces, and community settings, individuals can enhance their ability to understand, respect, and communicate effectively with people from different cultural backgrounds.

The results suggest the development of educational programs that promote multicultural competence. By incorporating the Multicultural Competence Framework into curricula, schools can foster skills and knowledge necessary for effective intercultural communication and understanding. Moreover, policy initiatives should focus on promoting integration and diversity while preserving individual and cultural identity. Measures to prevent "multicommunitarianism" can include policies that encourage interaction and collaboration among diverse ethnic groups, fostering a sense of belonging to the larger societal fabric.

The study has a limitation in generalizing findings due to a limited sample size and narrow geographic scope. Future research should aim for larger and more diverse samples to ensure broader applicability of results.

There also are methodological constraints, such as the use of specific research methods or data collection techniques, could have influenced the results. Addressing these limitations through mixed-method approaches or longitudinal studies can enhance the validity and reliability of findings.

Specific areas for further research and policy development could include: the impact of multicultural policies and initiatives on social cohesion and integration within diverse communities; the effectiveness of cross-cultural training programs in promoting cultural competence and reducing cultural stereotypes and biases; the role of media and popular culture in shaping perceptions and attitudes towards multiculturalism and diversity.

Strategies for promoting intercultural dialogue and understanding among different ethnic groups within multicultural societies are also of great importance as well as the development of inclusive and culturally sensitive healthcare, education, and social services to meet the needs of diverse populations.

Future research could as well explore the impact of multicultural policies and initiatives on social cohesion and integration within diverse communities. Investigating the effectiveness of specific policy interventions can provide insights into strategies for promoting inclusive societies. Further studies can evaluate the effectiveness of cross-cultural training programs in promoting cultural competence and reducing stereotypes and biases. Understanding how individuals acquire and apply intercultural skills can inform

the development of more tailored training approaches.

Finally, investigating the development of inclusive and culturally sensitive healthcare, education, and social services is vital. Understanding the unique needs and experiences of diverse populations can guide the design of more responsive and equitable service delivery systems.

This study offered valuable insights into the theoretical and practical dimensions of social integration in multicultural societies. By addressing limitations and proposing future research directions, the study lays the groundwork for continued exploration of the complex dynamics of cultural diversity and social cohesion.

#### Acknowledgment and conflicts of interest

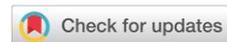
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## The impact of globalization on performance musicology: Challenges and opportunities for music education in the 21st Century

### Соціокультурні аспекти виконавського музикознавства у контексті глобалізації музичної освіти

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#### Abstract

Contemporary globalisation has a significant impact on the development of musical art. The aim is to analyse the socio-cultural aspects of performing musicology in the context of globalisation of music education. The implementation of this study involves the use of the following scientific methods. The content analysis and the method of systematization were used. The results of the study demonstrate that contemporary performing music trends in the arts are important components of socio-cultural spaces. They reflect not only the social transformations caused by globalisation of music that are taking place in society, but also have a direct impact on the formation of the artistic trend in general. It is demonstrated that there are bilateral relations that consist in the complex

#### Анотація

Сучасна глобалізація має значний вплив на розвиток музичного мистецтва. Метою є аналіз соціокультурних аспектів виконавського музикознавства в контексті глобалізації музичної освіти. Виконання даного дослідження передбачає використання наступних наукових методів. Зокрема, йдеться про контент-аналіз фахової літератури, метод систематизації. Результати дослідження свідчать про те, що сучасні напрямки виконавської музики в мистецтві є важливими складовими соціокультурних просторів. Вони відображають не лише соціальні трансформації, викликані глобалізацією та цифровізацією музики, які відбуваються в суспільстві, а й безпосередньо впливають на формування мистецького напрямку в цілому.

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coexistence between music and society. It is also determined that in modern conditions, the main practical task of today's performers is to convey their thoughts and feelings to the audience. The conclusions emphasise that in order to work effectively with modern artistic, educational and musicological environments, future specialists should master various means and methods of performing expression. It is recommended to deepen the use of digital technologies to achieve a new level of performance skills.

**Keywords:** intercultural integration, interdisciplinary methods, music, performing arts research.

## Introduction

Music and performing arts in modern globalised socio-cultural spaces have undergone significant transformations in the early twenty-first century. First of all, we are talking about the expansion of the genre stylistics of performers, the use of modern digital transformations and the increasing role of innovative technologies in musical creativity. Other important aspects of our time include the need for appropriate modernisation of artistic and performing music education, the development and intensification of festival and competition movements, and the integration of local schools and traditions into global music and performance environments. All these factors, on the one hand, lead to a growing scientific interest in the study of the contemporary development of music and performing arts, taking into account the current views of anthropocentric and cultural approaches.

On the other hand, the practical aspect of performance remains important, which affects not only theoretical science but also forms new methodological foundations and assessments of the creative potential of performers in the musical arts. Undoubtedly, this aspect also influences the formation of relevant pedagogical principles, methodological and scientific literature, changes to curricula, and their updating to meet the requirements of the labour market.

The use of new concepts opens up opportunities for a comprehensive study of music and performing arts through the projections of anthropological analysis, identifying the specifics of performance processes, substantiating the cultural relevance of music and

Показано, що існують двосторонні відносини, які полягають у складному співіснуванні музики та суспільства. Також визначено, що в сучасних умовах основним практичним завданням сучасних виконавців є донесення своїх думок і почуттів до глядача через дії на сцені. У висновках підкреслюється, що для ефективної роботи в сучасному художньо-освітньому та музикознавчому середовищах майбутнім фахівцям необхідно володіти різноманітними засобами та прийомами виконавської виразності для точної реалізації задуманих стилістичних чи образних елементів.

**Ключові слова:** міжкультурна інтеграція, міждисциплінарні методи, музичне мистецтво, дослідження виконавчого мистецтва.

performing arts education (the place of national traditions in the modern globalised world), and studying the peculiarities of the functioning of performing schools as expressors of established cultural traditions. Another relevant issue for further consideration is the organisation of music and concert practices that take into account the modern requirements of employers in the field of music and the conditions and changes in the contemporary socio-cultural reality.

Music and performance schools of our time function as a cultural tradition, so their specificity lies in their focus on preserving professional music and performance experiences, implementing various aspects of artistic creativity, in particular in the context of direct interpersonal communication. Performing schools, which are a phenomenal manifestation of artistic cultures, unite the creative unity of many representatives and successors, form appropriate sets of teaching methods that characterise the changes in the modern globalised world, which should be taken into account in the future.

Therefore, the purpose of the article is to investigate the socio-cultural aspects of performing musicology in the context of globalisation of music education. the realisation of the proposed goal involves the following tasks: to study the impact of globalisation on musicology, to highlight the patterns of interpretation and perception of a musical work in the social space, to determine in which aspects globalisation has had a decisive impact on performing musicology.

## Literature Review

The researchers analysed various aspects of performing musicology. Much attention has been paid to current trends in musicology. In particular, Green (2014) traced cross-cultural changes in the teaching of contemporary music against the background of global aspects. Bower (2023). He traced the modern aspects of the development of musicology as a science and an academic discipline.

In addition the study by Harrison (2023) investigated the process of self-expression during the performance of musical compositions, both instrumental and vocal. Wiley & Watt (2019) summarised the experience of teaching musicology with the use of modern digital technologies. It was also important to summarise the Ukrainian vector of education development (Hysa et al., 2023; Dushniy et al., 2022).

The second important area of research is the analysis of global trends in the development of cultural paradigms and the place of music in these trends. Thus, Rudenko & Kharkov (2023) highlighted the main trends in the philosophical understanding of educational traditions and the impact of globalisation on these processes. Bhandari (2023) traced the future trends in social development and the integration of music into it. Kertz-Welzel (2015) analysed the comparative aspects of musicology in the context of the globalised world. These studies make it possible to determine the foundations of modern global transformations of musicology.

It is important that Guo et al. (2020) emphasised the relevance of combining music with the environmental sphere, which allows for a new assessment of the possibilities of music therapy, the development of music services, etc. In contrast to this view, Boddie (2023) proposed a statement about the constancy of musical tastes, so that the fascination with new trends in musical art, understanding of its creative essence and influence on creative development are not subject to current trends in socio-political life, environmental activism, and the search for strategies to combine the social environment with music. This discussion is important from a theoretical point of view, as it demonstrates the role of music in public life, explaining how society and the realities of life influence music, and how its existence is separated from everyday life, as it belongs primarily to creative people for whom the problems of our time give way to creativity.

The analysis of the scientific literature has shown that the performing arts are included in a fairly wide range of studies, however, comprehensive cultural studies of the performing arts in the realities of the modern development of socio-cultural environments remain relevant. The study of music and performing arts, in addition to covering the processes of performing work in general, also includes other phenomena, studies of music education, concert life, criticism, musical instruments, means of reproducing performing arts, music information carriers, etc. These issues will require further analysis.

## Methodology

The study of music and performing arts and its place in modern society is based on a qualitative approach. It involves the involvement of modern scientific literature containing relevant thoughts and provisions, its analysis and a detailed consideration of research concepts.

The necessary scientific information was collected in several stages. At the initial stage, the most relevant scientific and metric databases of journals containing materials on the problems of contemporary music art and its place in anthropological paradigms were selected. For this reason, the main attention was paid to the scientific and metric databases Scopus, Web of Science, ERIH+, Crossref, and Worldcat.

The search in the relevant databases was carried out using the following keywords: cross-cultural integration, interdisciplinary methods, transcultural art, and musical anthropology. The small number of results obtained led to a certain expansion of the search and the addition of new keywords that detailed the educational features and role of music and performing arts in modern society (art education, modernity, digitalisation, innovation, training).

The search resulted in the identification of 262 relevant studies, which were pre-sorted based on the review of abstracts and analysis of keywords contained therein. Then the process of analysing the content of the works began: those studies that did not contain references to the socio-cultural aspects of performing musicology were eliminated. Using this approach, 75 literature items were selected.

The next step was to apply the exclusion criteria. We are talking about further consideration of those works that met the following requirements:

1. The study contains information that is directly related to the purpose of the research.
2. The study deals with the current state of performing musicology and its role in socio-cultural development.
3. The work deals with innovative technologies, relevant educational trends, cultural and anthropological significance, etc.
4. The study is devoted to highlighting the necessary methodological tools.
5. The study includes a review of modern scientific literature that is directly related to the research topic and on the basis of which certain generalisations can be made.

Using these criteria, 30 scientific papers were selected.

The chronological range of scientific papers included in the proposed study is from 2015 to 2024, which makes it possible to take into account the current positions of scholars.

#### Data analysis

An important method used for the preparation of the relevant study was the method of content analysis of the literature, which was used to systematise the information collected from the scientific literature. The application of the systematisation method made it possible to summarise the results of contemporary transcultural art and identify certain socio-cultural aspects of performing musicology. The application of the prognostic method made it possible to propose some possible scenarios for the further development of performing musicology in the modern realities of globalisation.

The proposed study also has certain limitations. First of all, we used English-language studies, which is due to the high citation indices of these works. At the same time, it is possible that important information was also contained in articles or monographs published in other languages. Although the proposed scope of the

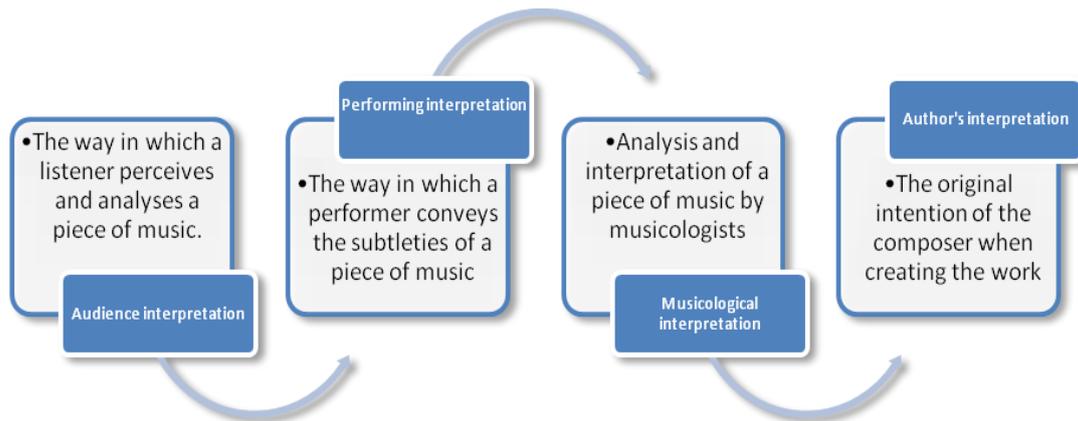
historiography review would have touched upon fresh and relevant thoughts written in non-English-language works, there is a possibility that some national aspects were left out of the research. Another important limitation is related to the global nature of the study, which aims to analyse global major trends. Obviously, the problem of concretisation requires considerable attention, and further research should be devoted to the local study of the performing arts.

The validity of the results was obtained by using different types of sources and checking the relevant references. Different points of view on the existing problems are taken into account, which makes it possible to continue researching this important area of social, artistic and educational life.

#### Results and Discussion

Contemporary performing music is an important component of the socio-cultural space. In particular, it reflects not only the social changes taking place in society, but also affects the very nature of these relations. Thus, modern scholars have determined that there is a two-way relationship, which is a complex interaction between music and society (Smith & Peters, 2023). It should also be recognised that music is an integral part and characteristic of any culture or people.

Like any artistic phenomenon, a piece of music evokes a large number of associations: this is the depth of its impact on the audience and the performers themselves. Contemporary researchers prove that a musical image, even if it depicts a phenomenon, still evokes not just one association, but several perceptions. In this context, the dual nature of art is noticeable, when its creation is associated with the personality of the author, and the fruits of his work are in the public domain (Martynenko et al., 2023). As a result, there are at least four main types of interpretations of a musical work: audience, performer, musicologist, and author's (i.e., the composer's own intention).



**Figure 1.** Scheme of interpretations and perception of a musical work in the social space.

Source: author's development

For this reason, the language of a piece of music is an important complex communication tool in the modern socio-cultural space and performs several important roles, including information

transmission, communication, cognition, expression of feelings and emotions, formation of thinking, and representation of human experience (see Table 1).

**Table 1.**  
*Functions of the musical language*

Functions of the musical language	Description
Communication function	Musical language is a means of communication between people.
Data transmission and storage function	Music allows you to transmit and preserve cultural and historical information.
Function of expressing feelings and emotions	Through music, people can express their feelings and emotions.
Formation of thinking	Music helps to develop thinking and imagination.
Accumulation of human experience	Music accumulates and transmits the experience of previous generations.
A means of cognition	Music helps in the process of understanding the world and oneself.
National self-identification	Musical language contributes to the formation of national identity.
Preserving and passing on experience and traditions	Music preserves and transmits the traditions and experience of the musical culture of the people.
Immersion in the semiosphere field	Musical language is integrated into the semiosphere - the space of cultural signs and meanings.
Dependence on the socio-cultural system of society	Musical communication is conditioned by the entire socio-cultural system of society.

Source: author's development

Thus, the musical performance language, as a set of means of musical expression, is an important part of musical communication and is conditioned by the entire socio-cultural system of society.

perception develops into a different quality of creativity.

Performing arts, as an important type of musical art, has the ability to play the role of a medium for inspiration in any field of human activity (Ockelford, 2023). For this reason, the performance of music should be at such a level that the impression of its perception has great potential. When the human senses of seeing and hearing are activated, i.e. when the process of distortion is particularly overwhelming, then

Performing activity should be different from musicology, which is addressed mainly to the inner ear of a professional. For this reason, the field of performing musicology plays an important role, a concept that is interpreted differently by scholars (Karlsen, 2021). Performing musicologists are specialists who study not only analyse, but also critically examine and interpret various aspects of musical performance. Their professional activities cover a wide range of important aspects, including the historical evolution of performance practices, the

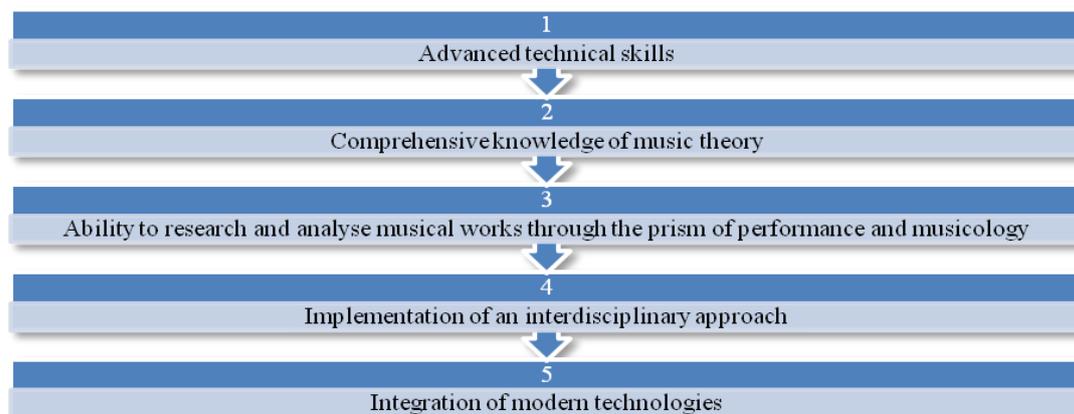
study of different styles and techniques of performers, and the study of the multifaceted influence of social and cultural context on music.

In order for a piece of music to be heard, not just listened to, it must be original and especially performed. Therefore, the authors of the article believe that performing musicology should be a science of music and its power of influence on both the performer and the audience (Sharif, 2023). The creative activity of the future musicologist is the core of the space of art, the coordinates of which are infinite in their length. Such a system of space is man-made, as it is created by the researcher himself. On the other hand, such a space is constructed by existing art objects and represents a structure that is capable of constant self-development (Pletsan, 2021). A space that is both self-organised and organised is a synergistic view of art as a system as a whole.

At the same time, it should be noted that the main practical task of the performer is to convey his or her thoughts and feelings to the audience through actions on stage. To do this, future musicologists should learn to use various means and methods of performing expression to accurately embody

the intended stylistic or figurative elements, intellectual and emotional content of the musical work itself. By implementing this approach, the future musicologist will learn to explore the unique mechanism of reproducing and perceiving a piece of music from their own perspective (Helena Vieira, 2021).

Also, future performers should learn to explore the mechanism of music reproduction and perception, perceiving the thoughts and ideas of composers as an advisory voice. Thus, the modern training of future professionals faces a challenging task. At the same time, the process of adapting performing musicology to modern globalised educational standards is a process that ensures the integration of national musical traditions into an international context (Boddie, 2023). This allows not only to preserve one's own cultural identity, but also to increase the competitiveness of graduates in the modern global market. Thus, for the effective training of performing musicologists, global educational standards play an important role. Figure 2 shows the main requirements of global educational standards in the field of music.



**Figure 2.** Main requirements of global educational standards

Source: Author's development

In order to comply with global educational principles, modern music education institutions usually undergo international accreditation (for example, NASM in the USA or AEC in Europe). In this way, diplomas and qualifications are recognised internationally.

A general trend in globalised music education is the integration of modern technologies. Taking into account the ever-increasing requirements for musicology specialists (against the background of the development of the performing arts), innovative methods of education play an important role, contributing not only to

theoretical skills but also to practical ones. Contemporary researchers prove that modern innovative technological tools play an important role in the process of adapting performing musicology to global educational needs (Guo et al., 2020).

Innovative technologies make it possible to effectively implement learning from any location. In this way, students not only receive new knowledge from teachers, but it also facilitates the ability of students to acquire knowledge and practice at home. Another important area is the use of virtual reality

technologies. In particular, various virtual masterclasses from musicians and leading teachers from around the world help to develop practical and research competences. Innovative software for analysing and recording music is an important tool for developing the professional skills of future musicologists of performing arts (Govorukhina et al., 2021).

A separate area of professional competence development for future musicologists is the internationalisation of curricula, which involves the inclusion of research and analysis of different cultures and styles. This approach not only develops a high level of knowledge among students, but also helps to broaden their musical outlook and intercultural communication skills, which are now in great demand in the modern professional world (Vasil, 2020).

At the same time, another area of globalised education is the development of academic mobility, which allows students to gain experience in different social and cultural environments. This, in turn, enriches traditional methods of teaching musicology and improves the quality of music education in general (Smith & Peters, 2023). Thus, given the development of modern performing music, the process of adapting musicology to global educational standards contributes to improving the quality of education and ensuring the competitiveness of graduates.

The results obtained have shown that the activities of a musicologist are completely different in nature from those of a performer. Their critical research activities define a wide range of research aspects, including the historical development of performance practices, the study and interpretation of performers' styles and techniques, and the study of the influence of the socio-cultural context on music (Boddie, 2023). On the other hand, the performing concept is based not only on the study of the composer's intention, but also on the musicologist's interpretation of it.

For this reason, in modern studies, it is determined that the key subject of research for a modern musicologist is the unchanging essence of a particular piece of music, that is, what is preserved in various professional performances, which is the whole composer's work (Horton, 2020; Medic, 2022). At the same time, it is worth agreeing with the argument that the performer's musical ideas can in no way replace or negate the need for theoretical musicology. However, it should also be acknowledged that an excessive

theoretical division of spheres of influence can in some cases hinder the very process of interpenetration of the branches of musicology.

At the same time, the study confirms the thesis of contemporary scholars that the research work of the performer should also take its place in music science. This is due to the specifics of the theoretical art of interpretation, which should have its own theoretical and methodological basis (Won, 2020). The results also demonstrate the importance of using innovative tools and technologies in the training of professional musicologists. The paper determines that, given the development of modern performing music, the process of adapting performing musicology to global educational standards contributes to improving the quality of education and ensures the competitiveness of graduates in general. Innovative approaches (interdisciplinary, personality-oriented) and modern digital technologies have been found to play an important role in this process.

These theses have been confirmed in a number of contemporary works. In particular, these ideas are consistent with Vasil (2020), who describes the role of interdisciplinarity in music teaching. In general, contemporary scholars also recognise the significant impact of digital technologies on globalised education. Hysa et al. (2023) described the importance of digitalisation and its main components in the education and science system. The authors also described the main challenges of digitalisation, primarily related to cybersecurity. These statements are supported by studies that directly address cybersecurity issues in the modern digital space (Lysenko et al., 2024). In general, modern scholars agree with the thesis that modern digital technologies are driving science and education (Milicevic, 2015; Rossikhin et al., 2020).

Some studies have also found that innovative tools generally improve students' research skills (Mandanici et al., 2023). In addition, the study by Kuzheliev, Zherlitsyn, Nechyporenko, Lutkovska & Mazur (2023), which describes the problem of implementing distance education in Ukraine, found that electronic technologies make the learning process more optimised and develop students' independent skills, which also correlates with this study. On the other hand, we agree with those researchers who believe that digital music and computer technologies have their own specificity, which is a new integrated digital type of music and computer activity. The latter is a set of actions for the formation,

processing, interpretation and reproduction of musical and artistic material in digital format.

At the same time, the implementation of this activity involves professional training, the formation of musical and digital knowledge, skills and abilities. However, the study also has certain limitations. First of all, English-language studies were used, which is due to the high citation indices of these works. At the same time, it is possible that important information was also contained in articles or monographs published in other languages. Although the proposed scope of the historiography review would have touched upon fresh and relevant thoughts written in non-English-language works, there is a possibility that some national aspects were left out of the research. Another important limitation is related to the global nature of the study, which aims to analyse global major trends. Obviously, the problem of concretisation requires considerable attention, and further research should be devoted to the local study of the performing arts.

### Conclusions

Thus, the critical research activities of contemporary musicologists of the performing arts define a wide range of research aspects, including the evolution of performance practices, analysis and interpretation of styles and techniques, and determination of the influence of social and cultural contexts on music. The main subject of research for a contemporary musicologist is the unchanging essence of a particular piece of music - that which is preserved in various professional performances, representing the whole composer's creation. In the current circumstances of globalisation and the development of digital technologies, it is extremely important to form an appropriate musical performance language, the universality of which determines the impact on the socio-cultural system of society.

Musicology studies, as an important element of contemporary musical art, have the ability to be an important environment for manifestations of inspiration in any sphere of human existence. Performing work differs from musicological work, which is addressed to research paradigms. Therefore, the areas of performing musicology, as a discipline that not only analyses but also critically examines interpretations of musical performance, performance, biography and the integration of cultural heritage into the global artistic space, are becoming important.

Given the wide range of individual aspects, including the historical traditions of performance practices, the combination of different styles and techniques of performers is part of the impact of globalisation, which partially blurs the distinction between cultures and peoples. Given this influence of globalisation, in order to work effectively with modern artistic, educational and musicological environments, changes should be made in teaching methods so that future specialists have good cross-cultural competencies, know various means and methods of performing expression to accurately implement the intended stylistic or figurative elements.

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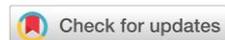
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## Organization of a STEM-oriented environment in higher education institutions

### Організація STEM-орієнтованого середовища у ЗВО

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#### Abstract

The article analyzes the meaning of "STEM education", revealing personal and social aspects. The main organizational forms and open online tools for implementing STEM education are shown. The most important functions and goals of the educational environment provided by Google services for the implementation and organization of STEM projects in higher education institutions and the most significant approaches used for the organization of STEM education are highlighted; the importance of the STEM-oriented approach in education is emphasized, for its implementation in education the mandatory use of educational e-platforms is emphasized. When implementing and creating STEM projects in higher education institutions, it is important and necessary to use information and communication technologies, and virtual and augmented reality technologies. Implementing a

#### Анотація

У статті проаналізовано зміст поняття «STEM-освіта», розкрито особистісний та соціальний аспекти. Показано основні організаційні форми та відкриті онлайн інструменти реалізації STEM-навчання. Виокремлено найвагоміші функції та цілі освітнього середовища, які забезпечують сервіси Google для впровадження та організації STEM проєктів у закладах вищої освіти та найсуттєвіші підходи, які застосовуються для організації STEM освіти; наголошено на важливості STEM-орієнтованого підходу в освіті для впровадження якого в освіту наголошено на обов'язковому використанні освітніх е-платформ. При впровадженні та створенні STEM-проєктів у заклади вищої освіти важливим і необхідним є використання інформаційно-комунікаційних технологій, технологій віртуальної та доповненої

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STEM approach to education results in a fruitful and stimulating STEM-oriented environment. Through experimental research, the importance and necessity of organizing a STEM-oriented environment in institutions of higher education was revealed, and the ways of using STEM technologies in higher education with a view to the formation of professional skills were clarified. Methodological recommendations have been developed for the implementation of the STEM approach in the practice of the educational process, where it is necessary to organize a STEM-oriented environment in higher education institutions and create certain optimal conditions.

**Keywords:** STEM-oriented environment, institutions of higher education, STEM-oriented approach, STEM-education, students of higher education.

## Introduction

The advent of the Internet has fundamentally changed society. It is necessary to shift the emphasis in education from memorizing information and performing routine mechanical tasks to preparing specialists for various tests for the formation of innovative skills of the 21st century: creative problem solving, effective cooperation, project management, making important decisions, achieving defined goals, perseverance, determination, directing their passions and talents to improve the lives of people and the world. STEM education, in this context, the implementation of which began in the USA in 2009 at the state level under the "Educate to Innovate" program, is a pedagogical innovation of the beginning of the 21st century (Polihun et al., 2019).

There is a need in modern conditions for mixed and distance learning: the organization of STEM education is necessary, to conduct work in the direction of technologies, natural sciences, art, technical creativity, and mathematics. This issue is also relevant because specialists in the labor market who possess modern key and professional competencies related to technical fields of knowledge and use integrated knowledge to solve tasks are in greater demand now. We see the significant advantages of STEM education, which opens up wider opportunities for those seeking education, and not only affects the simplification of the educational process since it is about independent learning under the guidance of a mentor and a practice-oriented approach to learning (Sharova et al., 2023).

реальності. Впровадження STEM-підходу в освіту призводить до плідного та стимулюючого STEM-орієнтованого середовища. Шляхом експериментального дослідження розкрито вагомість і показано необхідність організації STEM-орієнтованого середовища у закладах вищої освіти та з'ясувано шляхи використання STEM-технологій у вищій школі з виходом на формування професійних навичок. Розроблено методичні рекомендації для реалізації впровадження STEM-підходу в практику навчального процесу де необхідним є організація STEM-орієнтованого середовища у закладах вищої освіти та створення певних оптимальних умов.

**Ключові слова:** STEM-орієнтоване середовище, заклади вищої освіти, STEM-орієнтований підхід, STEM-освіта, здобувачі вищої освіти.

We are witnessing a change in the learning environment that occurred during the 2020 coronavirus pandemic, which necessitated the transition to distance learning. This change, despite the challenges associated with technical skills and adaptation of a person to a new learning environment, opened up new opportunities in the implementation of elements of STEM education. The presence of platforms, online services, and free mobile applications are useful for creating innovative, original, and interesting classes on any topic provided by the educational program. This ensures the relevance of the study of the possibilities of software products and electronic tools in the implementation of elements of STEM education in classes in institutions of higher education in the conditions of modern education (Rudenko & Zaitseva, 2022).

Investigating the organization of a STEM-oriented environment specifically in higher education is important. The key aspects of the STEM approach in higher education are:

- integration into a single paradigm of the content and methodology of natural sciences, modern technologies, in particular information, engineering design, and mathematical tools;
- designing curricula and programs on an interdisciplinary basis;
- integrated learning according to certain topics, not individual disciplines;

- application of cognitive and social technologies, as well as transfer knowledge;
- training on real technical-technological, economic, and socially significant problems;
- emphasis on the complex formation of scientific and engineering thinking.

The problem of organizing a STEM-oriented environment in higher education institutions in both theoretical and practical aspects is insufficiently researched, which is reflected in the lack of a unified understanding of the essence of this process.

The urgency of solving the outlined problem is enhanced by the aggravation of several contradictions that characterize modern higher education in Ukraine, in particular:

- between social requirements for the saturation of the educational process with modern technologies and the unpreparedness of the education system for a quick correction of the value orientations of the average teacher for their use;
- between the fragmentation and separation of the study of individual disciplines in the professional training of specialists and the integrity and integration of scientific knowledge through the practice of STEM education;
- between the need to study and take into account the individual characteristics and preferences of education seekers and the traditionally depersonalized methods, forms, and means of their education;
- between the general global trend of gender equalization of the influence of women and men in engineering and technology and the too-slow imitation of this process in the higher education system of Ukraine.

Insufficient theoretical and practical study of the outlined problem, its social importance, and the presence of several contradictions in modern higher education led to the choice of the topic of the article.

### Literature Review

At the beginning of the 21st century, the abbreviation "STEM" was first used by the American professor Georgette Yakman (2017), who is the founder of this direction in the educational space. Since then, "STEM" has become a buzzword in education, even though it is a controversial and complex concept. According to the researcher, "Science and technology are transmitted through engineering

and art – all this is based on mathematical elements". Educational research has proven the effectiveness of STEM education in student learning (Gao et al., 2020) and the professional development of the individual (Shernof et al., 2017). Scientists outline features, define, and improve practical and theoretical aspects of implementing STEM education in the world. N. Polihun, K. Postova, I. Slipukhina, H. Onopchenko, & O. Onopchenko (2019) proposed, first of all, for gifted students of educational space, models of integration of informal and formal education, which may become the basis of transformational processes for education in general in the future. The ways of using engineering design and the scientific method in the construction of STEM educational events are revealed, methodical approaches to the organization of STEM projects are proposed, the features of the educational STEM environment are revealed, and the use of the STEM environment is demonstrated on specific examples.

To create and support a STEM-oriented educational environment of the N. Soroko, & I. Pylypchuk (2020) educational institution, Google services were considered. The requirements of users that take into account Google services are shown (providing opportunities in the online environment to conduct joint research for participants of STEM projects; using tools that ensure group work when working with documents of various formats; managing the distance educational process; monitoring the research process; data sets that embody the information of research that has already been conducted; to create space for other educational projects in the environment of special programs).

T. Sharova, S. Sharov, & B. Kreminskyi (2023) devoted their research to the review of educational online resources to organize STEM training for young people. Scientists highlighted the main approaches for organizing STEM/STEAM education; analyzed the benefits and reasons for the relevance of STEM education; and proved that the basis of STEM education is project activity, practical-oriented learning, and interdisciplinary approach; examples showed the implementation of STEM education when using electronic educational resources, massive open online courses, Google services.

The ways of using software products and electronic tools in the process of implementing elements of STEM education (Technology,

Science, Engineering, Mathematics, Arts) in classes in institutions of higher education in the conditions of online education were considered by N. Rudenko, & S. Zaitseva (2022). STEM education is presented by researchers as an integrated project approach that has a practical orientation in pedagogy. The capabilities of mobile applications (VivaVideo, Movavi Clips, InShot, FilmoraGo, InShot) for creating educational videos, free web services (Google Classroom, Google Meet, Google Calendar), and programs for implementing project tasks (Microsoft Publisher) were studied. The advantages of STEM education are described. S. Belbase, B. Mainali, W. Kasemsukpipat, H. Tairab, M. Gochoo, & A. Jarrah (2021) also discussed the advantages of STEM education in schools and institutions of higher education, proved that STEM education is an integrated project approach in pedagogy and has a practical orientation. In educational institutions, an analysis of Google's main services was carried out to introduce the STEM approach to education, which made it possible to offer teachers basic solutions for their use to support, organize, and manage the STEM-oriented educational environment of an educational institution.

J. Costley, & C. Lange (2017) also showed the benefits of using technology in STEM education (reducing cognitive load and improving students' learning motivation). The contents of the most popular educational online services and platforms, free mobile applications for creating original and interesting classes have been revealed by research; the role of software products in the formation of students' language skills and the enrichment of their vocabulary was investigated.

O. Zawacki-Richter, V. Marín, M. Bond, & F. Gouverneur (2019) showed the ways of use and proved the need for the use of artificial intelligence in education, which proves the upward trend of education, as it contributes to increasing the ability of students to study analytics and strengthens the competitiveness of a specialist in the future in the labor market. To implement a positive impact on the educational process of the STEM-oriented environment in institutions of higher education, it is important to introduce innovative technologies, in particular artificial intelligence, gamification in learning design, etc., teachers should teach students how to use the tools of the STEM-oriented environment in classes to improve their educational interest

**Purpose of the article.** To reveal the importance and show the necessity of organizing a STEM-oriented environment in institutions of higher education and to find out ways of using STEM technologies in higher education with a view to the formation of professional skills.

## Methodology

The methodological principles of the research are leading provisions of the theory of scientific knowledge; general scientific principles of historicism, systematicity, and scientificity; conceptual provisions of pedagogical, psychological, and sociological sciences; ideas of comparative research experience based on the simultaneous study of pedagogical, socio-cultural and economic phenomena; philosophical and pedagogical ideas of the development of modern education.

Research methods were used to achieve the goal:

- theoretical: analysis, synthesis, comparison, systematization, generalization, – analysis of psychological and pedagogical sources to clarify the key concepts of the study; study of provisions, and concepts;
- empirical: questionnaires, pedagogical observation – to find out ways of using STEM technologies in higher education with a view to the formation of professional skills;
- a pedagogical experiment for scientific confirmation of the purpose of the research;
- methods of mathematical statistics – to check and process research results using the Spearman rank correlation coefficient and the Kolmogorov-Smirnov agreement criterion.

The purpose of the experimental work was to reveal the significance and prove the necessity of organizing a STEM-oriented environment in institutions of higher education and clarifying the ways of using STEM technologies in higher education with a view to the formation of professional skills.

We developed an anonymous questionnaire, which was used to understand the importance of organizing a STEM-oriented environment in higher education institutions and to find out ways of using STEM technologies in higher education with a view to the formation of professional skills.

The questionnaire contained closed-type and open-type questions.

Our method of studying educational technologies was to use the method of surveying teachers and students who implement forms of STEM education and various directions in education.

As a result of the experiment, 145 respondents were involved. We found out that out of all (145) respondents – 30% use STEM technologies in higher education to form professional skills.

The research was conducted online. Quantitative and qualitative analysis procedures were used to process empirical data.

For comparative analysis and generalization of data, to ensure the possibility of comparison of data, they are given in relative values (%).

The implementation of the pedagogical experiment was carried out in three stages: preparatory, main, and final.

At the preparatory stage, the purpose and tasks of the research were determined, the experimental plan was developed, methods of measurement and processing of results were selected, control and experimental groups were selected, and their homogeneity was checked.

At the main stage, an experiment was conducted.

At the final stage, the results of the experiment were analyzed, their reliability was confirmed, and conclusions were drawn about the pedagogical effect of the experiment.

Research relies heavily on the accuracy and reliability of the data. In the framework of research work, the quality of data collection and analysis not only adds weight to the research but also contributes to the formation of sound conclusions, which is the key to academic success.

The following digital data collection tools were useful in the study:

- Google Forms – a simple tool for creating surveys that allows you to collect data from respondents, create different types of questions, and collect answers in spreadsheets.
- SurveyMonkey – a modern survey tool that offers a wide range of customization options and analytical tools for analyzing the collected data.
- JSTOR, Google Scholar, and other academic search engines provide access to scholarly articles, books, and other academic

resources that may be useful for literature review and theoretical data collection.

- Zotero or Mendeley – bibliography management programs that help organize research materials, store references, and format bibliographies and citations according to different citation styles.
- Microsoft Excel or Google Sheets – spreadsheets are useful for organizing and analyzing collected data when working with quantitative data.
- SPSS, R, or Python for more advanced data analysis, statistical analysis, and processing of volumes of data.

When determining the sample of subjects, the general specificity of the research subject was taken into account. The total sample size is 145 subjects, among whom are students of physical education. When forming the sample, the criteria of meaningfulness, representativeness, and equivalence were taken into account. The sample was formed by random selection using the technical procedure for calculating the selection step.

The reliability and validity of the obtained results, and the objectivity of their assessment were ensured by the methodological soundness of the initial positions and the qualitative mechanism for evaluating the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

To assess the homogeneity of experimental and control data, statistical processing was performed using MS Excel and SPSS (Statistical Package for Social Science).

## Results and Discussion

**Concept of STEM education: personal and social aspects.** In an interdisciplinary and applied context, STEM education includes in its content integrated training of higher education students in such specialized disciplines as technology, mathematics, natural sciences, art, and technical creativity. The development of the motivation of students of higher education during the educational process will be facilitated by the use of STEM elements because the activity of the teacher will be aimed specifically at solving integrated research tasks (Kryvoviyaz et al., 2023).

In a broad context, STEM education is an innovative pedagogical technology for the

development and formation of mental, cognitive, and creative qualities of higher education students, the level of which determines the competitiveness of an individual in the modern labor market.

As a process of external influence on a person, STEM has the following aspects:

- personal – acquisition of practical authentic experience of innovative activity;
- social – preparation for employment and further education by the requirements of the 21st century.

The STEM approach in the educational process involves the formation of "soft" skills defined in Framework P21 and makes it possible to cover the sphere of creative potential, combining research and innovation activities, creativity, and creating horizontal connections between society, fields of knowledge, and the surrounding world.

With this approach, the STEM teacher is an active developer of interdisciplinary educational programs. Based on the system of practical skills and scientific knowledge, he has:

- determine the sequence, volume, and content of training;
- to determine the degree and nature of the integration of knowledge from various Gnostic fields;
- choose methods, methods, and strategies to ensure the most expected pedagogical result;
- expand the content of one's own professional training;
- constantly raise the level of the profession.

Such activity is not limited to teaching one's own subject. What is important is the ability of the teacher to organize the educational process as a pedagogical interaction, which will be aimed at preparing the student to solve life-creating tasks, in personality development.

The development of STEM education requires didactic developments, scientific new research, and literate and educated young talents, ready to change and change the world (Polihun et al., 2019). Therefore, STEM is "a modern educational model that focuses on practice, encouraging independent learning, independent research, and creativity" (Rudenko & Zaitseva, 2022).

In our time, manual labor is being gradually displaced in favor of robotic labor, that is, preference is given to the use of computers and

robots due to the rapid digitization, modernization, and technology of various industries.

The number of professions that can be replaced by robots in the future reaches 60%, which is a great challenge for society in the world. Due to constant progress, there is a shortage of technical and scientific personnel on a global scale and, as a result, there is a greater demand for them than for humanitarian specialties. Therefore, STEM education is relevant today, because it is precisely this that meets the challenges of society. STEM education resembles a bridge between skills, careers, and knowledge, which are important criteria for the formation of scientific and technical personnel (Kryvoruchko & Shukatka, 2023).

### **Basic organizational forms and open online tools for the implementation of STEM education.**

For high-quality implementation of STEM education, it is necessary to use such basic organizational forms as:

- STEM project – educational and cognitive, group, game, or creative activity of students of higher education, involves the integration of three or more STEM disciplines, has a common goal, means, and methods of activity, and is aimed at achieving a common result;
- STEM classes – a form of organization of the educational process with a group of permanent students in a given period, which involves the integration of three or more STEM disciplines;
- STEM course – combining several STEM disciplines into a single academic discipline;
- STEM hackathon – a joint activity of higher education students with various interests in STEM fields who work on creating a new product or solving a given problem;
- STEM-quest is a search team game, the main principle of which is the step-by-step execution of previously prepared logical tasks aimed at obtaining a single final result from STEM disciplines (Polihun et al., 2019).

The implementation of STEM education in institutions of higher education requires teachers to develop, using the STEM approach, methods of conducting classes, systematic educational activities, and event scenarios using the necessary tools of the STEM approach, which is a special support for such an innovative

environment. The choice of tools to support and organize a STEM-oriented educational environment of a higher education institution, and teacher training is important for the use of STEM-approach tools in one's professional activities to improve the educational process of a higher school.

For high-quality system support of the STEM-oriented educational process of the higher school, it is necessary to use the services of the company Google – open online tools that offer a significant range of services to ensure the organization of such an environment.

The National Institute of Standards and Technology of the USA has proven that "cloud computing is an effective service for providing the user with on-demand access anywhere and anytime to the common computing resources of subjects of various human activities", which also applies to the educational process of a higher school, which can be provided in the interaction with the service provider synchronously or asynchronously with minimal management effort (Mell & Grance, 2011). With this approach, the services of the Google company became important – open online tools, which as early as 2014, on the initiative of researchers (Etherington (2014) and Magid (2014)), began to adapt Google tools in the field of education to the educational and teaching activities of users according to various educational problems (ensuring continuous communication between the teacher and the student; lack of opportunity for the student to study at the institution for various reasons, etc.) to ensure a convenient distance educational process. In 2015, Google announced that users of its services would share access to Google Classroom. Google Calendar has been integrated into Google Classroom. Google Apps Education Edition, designed for the education space, provides free educational services for educational institutions containing Google Apps tools supported by many devices for work in an educational environment. Google Apps provides an opportunity for educators to use sites developed by them for educational purposes, promotes the activation of students' cognitive activities, and provides access to various exercises in the cloud, tasks, etc.

To organize and support a STEM-oriented educational environment, Google Services has developed services that enable students to:

- for conducting STEM projects, create sites without using the HTML language;

- to ensure constant communication between STM project participants;
- compatible with teachers of various STEM fields to transfer and store data, conduct online lessons, and review them regardless of the user's location and at any time;
- recognize scanned photos and materials;
- create presentations, drawings, diagrams, and other documents in the cloud;
- keep a calendar of events of STEM projects;
- observe phenomena within STEM projects for conducting research;
- conduct online monitoring.

Google Classroom, Google Apps, Google Sites, Google Video, Google Docs, and Google Sites are such programs that support the cooperation of teachers, students of higher education, and stakeholders asynchronously and synchronously.

Teachers use Google Classroom as a management system for joint teaching of the curriculum, the use of joint activities, and the exchange of developments and materials. Google Classroom integrates with Google Docs, Google Drive, and Gmail. Thanks to this service, it is possible to organize flipped learning, distance learning, and project work to support a STEM-oriented educational environment of a higher education institution.

Google Apps includes functions such as processing spreadsheets, texts, presentations, and forms.

With the help of Google Sites and Google Video, students can jointly add images, documents, and videos, and create websites.

Google Classroom allows users to:

- create your course;
- share necessary educational material with students;
- to organize the registration of students for the course;
- organize student interaction;
- propose tasks for students;
- evaluate students' tasks and monitor knowledge.

**Functions and goals of the educational environment provided by Google services for the implementation and organization of STEM projects in higher education institutions.**

Within the framework of the implementation and organization of STEM projects in institutions of higher education, Google services provide the functions of the educational environment to provide higher education students with general educational resources, namely:

- websites and programs for creating flashcards and quizzes (Google Forms, Google Slides, Google Sites, etc.);
- Google Search, electronic libraries, and other electronic educational resources;
- tools for creating mental diagrams, diagrams, and maps (Google Suite + Lucidchart);
- services for group work (Padlet online board, Google Apps for Education), etc.

It is also important to use Google services for specific purposes of a STEM-oriented environment, for example:

- for research and familiarization of scientific concepts with the help of modeling and the use of educational models (Google Earth VR for topography, when studying historical and geographically important areas of the study of the Earth and its three-dimensional structure, etc.);
- applications and websites are necessary for studying robotics (Google Play offers the games "Robotics Engineering", "Robotics!", and "Industrial Robotics 3D");
- for photo analysis – Google services and applications (Google Lens, which helps the user to identify an object based on a neural network using visual analysis, collect information about the object depicted in the photo), etc.

The student of higher education chooses electronic educational resources according to the goals of the individual STEM project, the form (informal, formal, informal), and the level of education for which this project is designed.

Google services take into account the educational requirements of users, and students of higher education:

- data sets representing the information of already conducted studies;
- providing opportunities for STEM project participants to conduct collaborative research in an online environment;
- use of tools that create an innovative space for group work on documents of various formats;

- remoteness in managing the higher education process;
- monitoring of the research process;
- to create space for other educational projects
  - combined in the environment of special programs (Soroko & Pylypchuk, 2020).

### **STEM-oriented approach in education.**

The STEM-oriented approach is one of the current directions of innovative development and modernization of humanitarian and natural-mathematical profiles, which contributes to the implementation of life tasks, when solving which the development and formation of the engineering and scientific thinking of a specialist takes place, that is, it is focused on the innovative solution of emerging problems in the present. Creating an appropriate innovative environment is one of the ways to introduce the innovative STEM approach into the educational process of higher education institutions.

The STEM environment of a higher education institution includes in its essence the internal (software and hardware component, administrative and organizational component, educational and methodological component, subject component) and external (scientific institutions of higher education, research organizations, state education management bodies, business structures, industrial enterprises, stakeholders, sponsors, interested parties) provision.

The goals of STEM education are:

- in creating an environment for improving the qualities of citizens of the 21st century, understanding STEM,
- in the development of human resources in engineering, technology, science, and mathematics.

So, the STEM approach is:

- educational strategy;
- inspiration for a transformational approach to education, innovations in education, and the development of society (Liao, 2019).

For the process of higher education to correspond to the concept of STEM, it is necessary to turn training towards the teamwork of the students of higher education themselves, to change the usual form of teaching, when the class takes place around a teacher of a higher school.

The teaching method of STEM education is based on the organization of creative experimental activities and practical activities. Such forms of organization of learning as learning through deliberate play, teaching by topics through innovative approaches, simulation of real experience, and clubs allow students to explore, ask questions, and solve problems. The more complex the games, which require more skills (problem-solving, social communication, etc.), the better the higher education students will be able to learn the new material.

STEM pedagogy provides higher education students with metacognitive and cognitive tools to explore innovative ways of creative problem-solving. Rapid social changes and scientific and technical achievements of today are interrelated with the globalized influences of modernity and require creative thinking from the student as an essential adaptive skill for further career. One of the most significant achievements of STEM education is that it promotes non-standard thinking, creates conditions for joint work that allows each student to share knowledge, ideas, and experience in class, and provides an atmosphere of innovation and creativity in society (Rudenko & Zaitseva, 2022).

#### **Use of educational e-platforms for effective implementation of STEM-oriented approach in education.**

For the effective implementation of a STEM-oriented approach in education, it is important to use educational e-platforms that satisfy the interests of students in STEM fields, influence the development of research students' creative skills and abilities; help the teacher to solve the problems of motivation of students of higher education during their studies, to create in the educational environment educational projects, creative tasks, problematic issues that will contribute to the quick and high-quality application of skills and abilities by students from all STEM educational disciplines with the help of knowledge synergy.

To support the STEM-oriented environment of higher education, the educational e-platform provides:

- means (ICT) that ensures cooperation and communication between students; between teachers; between students and teachers; employers, specialists, students, teachers, etc., which can be carried out with the help of Internet conferences, webinars, open forums, etc.;

- open electronic educational resources, which include resources for teachers and students of higher education and through electronic libraries, electronic textbooks, blogs of scientific and pedagogical workers and students, distance courses, websites of the Ministries of Education, etc. may be distributed;
- online self-assessment and evaluation, which is carried out through Olympiads, contests, quests, projects, tests, etc., which contribute to the development of information and digital competence and future specialists, motivate students to study the STEM discipline and, by the requirements of society, contribute to the modernization of education;
- individual profiles of members of the educational, STEM-oriented environment, where data about the participant, participation in STEM projects, student academic achievements, and certificates can be placed; forums where the student of higher education participates and other electronic educational resources that are necessary for teaching or learning;
- innovative laboratories covering simulation models, games, stimulators, etc. (Soroko, 2019).

Most often, gifted youth join STEM, who strive for the further application of new knowledge obtained by innovative methods, and are interested in STEM education from the point of view of using modern equipment:

- 3D printers,
- holographic means,
- educational electronics, etc.

With its help, students of higher education learn in practice how to create a certain product, design, and analyze their own actions during the performance of a certain task.

#### **Approaches to the organization of STEM education.**

Let's highlight the most important approaches that are used for the organization of STEM education:

- within the study of certain educational subjects – organization of problem-oriented activities;
- for the further choice of the direction of scientific or technical activity, better understanding of the material – integration of knowledge of STEM subjects;

- using the method of projects, technological education, problem-oriented learning – practical orientation of STEM subjects;
- for full implementation of the STEM approach – integration of several subjects into one curriculum (Borzyk et al., 2023).

When implementing and creating STEM projects in institutions of higher education, it is important and necessary to use information and communication technologies, and virtual and augmented reality technologies (Soroko, 2021). The teaching of theoretical material in institutions of higher education is implemented with the help of video broadcasts, presentations, placement of text materials, etc., and the organization of scientific school excursions, laboratories, practical classes, etc., which require a special approach and require the mandatory use of virtual and augmented means, becomes a significant problem. Reality.

When creating a STEM project, the teacher must determine the problematic issue that will be solved by students of higher education, develop additional questions for planning activities, clarify research methods, and research hypotheses, selecting virtual and augmented reality tools for work on the STEM project and creating their products, such as research presentations using DR applications (Acrossair, Layar, Wikitude, Vuforia, Aurasma, Metaverse, Blippar, UniteAR, etc.), or stories or a virtual museum using Web platforms (Blippar, CoSpaces, Metaverse, etc.), which opens up new possibilities in the organization of the educational process. These tools, as a supplement to the organization of STEM projects, can be used to motivate students to study STEM subjects. Their expediency is necessary when studying the most complex topics and for training professional skills, which will significantly improve students' perception of the material, and the educational process, and expand the opportunities for them to carry out laboratory work and research (Gayevska & Soroko, 2022).

## Experiment

The purpose of the experimental work was to reveal the importance and the necessity of organizing a STEM-oriented environment in institutions of higher education and clarify the ways of using STEM technologies in higher education with a view to the formation of professional skills.

We developed an anonymous questionnaire that was used to understand the importance of

organizing a STEM-oriented environment in institutions of higher education and to find out ways of using STEM technologies in higher education with a view to the formation of professional skills.

The questionnaire contained closed-type and open-type questions.

Based on the analysis of the survey results, we asked the question and found out: "Which specific style of communication should dominate the implementation of "STEM technologies?". The respondents believe that a certain style of communication should dominate the communication between students of higher education and teachers to establish an effective educational interaction for the implementation of "STEM technologies":

- liberal (6.0%);
- democratic (46.5%);
- humanistic (47.5%).

As a result of the experimental work, we found out that from all (145) respondents – 30% use STEM technologies in higher education to form professional skills.

Answering the question: "What is most important to you in the process of using STEM technologies?" respondents singled out:

- creation of problem situations – 94% (STEM, according to the respondents, provides an opportunity through projects and practical tasks to develop problem-solving skills, promotes critical thinking and a creative approach);
- changing the role of the teacher – 92% (from the contributor, the use of STEM approaches requires a transition to the facilitator of learning. – from the role of "narrator");
- integration of subjects – 98% (STEM supports the integration of subjects, which is important for building connections between different areas of knowledge – respondents believe, and also contributes to a deep understanding of concepts and assimilation of material);
- use of digital technologies and tools – 87% (a key aspect of STEM approaches is the use of modern technologies to increase interest and effectiveness of education);
- development of creativity – 93% (STEM supports students' development of creative skills, and stimulates innovativeness and creative thinking).

**Table 1.**  
*The use of STEM technology in higher education for the formation of professional skills*

What is most important to you in the process of using STEM technologies?	Answers in %
Creation of problem situations	94
Changing the role of the teacher	92
Integration of subjects	98
Use of digital technologies and tools	87
Development of creativity	93

The respondents gave the following answers to the question "What difficulties may students of higher education encounter when using the STEM approach in higher education classes?"

- technical training – 92% – experience difficulties in implementing digital technologies, developing projects related to science or engineering that require specific technical skills;
- integration of subjects – 54% – requires additional resources and additional time for

the development of projects and integrated lessons;

- lack of time – 47% – for opportunities to work in groups, for creative activities, classes;
- lack of access to resources – 41% – there is a lack of equipment, necessary materials, and technical means for conducting STEAM projects;
- monitoring of integrated projects – 39% – efficiency of ensuring a balance between the development of practical and creative skills and the assessment of subject knowledge.

**Table 2.**  
*The use of STEM technology in higher education for the formation of professional skills*

What difficulties may students of higher education encounter when using the STEM approach in higher education classes?	Answers in %
Technical training	92
Integration of subjects	54
Lack of time	47
Lack of access to resources	41
Monitoring of integrated projects	39

Introducing a STEM approach to education, despite the aforementioned difficulties, can lead to a fruitful and stimulating learning environment.

Therefore, the analysis of questionnaire data on the use of STEM technologies in higher education shows that in institutions of higher education that successfully integrate this approach, students achieve significant results in development and learning.

A key aspect of the STEM approach is a creative approach to teaching, creating a stimulating environment where students can develop critical thinking and apply their creativity.

Our method of studying educational technologies was to use the method of surveying teachers and students who implement forms of STEM education and various directions in education. The research was conducted online. Quantitative

and qualitative analysis procedures were used to process empirical data.

For comparative analysis and generalization of data, to ensure the possibility of comparison of data, they are given in relative values (%).

The majority of respondents use the following technologies (as data analysis showed): as an organization of educational group activities, project activities, and formation of a creative personality. Cooperative learning is more interesting and effective. This is what the respondents said. They noted the importance of a benevolent attitude towards each student of higher education, joint creative activity, and willingness to help, which contributes to their moral development and intellectual development. Joint creative activity promotes the use of project technology. Modern educational technologies show the importance of the leading principle of STEM education – transdisciplinary integration.

## Guidelines.

Methodological recommendations have been developed for the implementation of the STEM approach in the practice of the educational process, where it is necessary to organize a STEM-oriented environment in higher education institutions and create certain optimal conditions, namely:

- use of group work, design, and scientific, interactive, teaching methods to create an atmosphere of co-creation, cooperation, and self-realization of each individual.
- creation of a society for interpersonal tolerant democratic interaction, to promote a dialogical and humanistic style of communication;
- application of problematic actual situations for the productive, creative activity of higher education students.

To best prepare a student for the use of STEM in professional activities, the following algorithm of actions should be followed:

- 1) introduction to the concept of STEM (declaration of the main values and principles of the STEM approach. Explanation of how science, engineering, technology, mathematics, and art can be integrated to improve educational activities and the development of students.
- 2) conducting experiments, considering the possibility of using technologies, solving real problems;
- 3) project development: designing projects that combine science, engineering, technology, mathematics, and art with other STEM fields;
- 4) acquaintance with digital tools for the development of the student's technological skills, to use them to support STEM approaches (virtual reality, modeling, etc. technologies);
- 5) to develop joint projects – cooperation with teachers of other subjects to enrich the experience of students;
- 6) formation of a stimulating and creative environment in the educational space, providing access to various tools and materials that contribute to the creativity of the individual;
- 7) involvement of technical experts in the institute to establish connections with specialists in the fields of technology, science, and engineering for the opportunity to see how STEM is used in real life;

- 8) evaluation of the process, not only the results of activities, the development of an evaluation system that takes into account cooperation, the work process itself, a creative approach, and not only the final results of projects.

The practical significance of the research lies in the development and implementation in the practice of higher education institutions of the methodology of applying STEM technologies in the process of training future specialists and providing a scientific and methodological basis for this process: lectures, practical classes, laboratory research, which will contribute to the improvement of the quality of education and the readiness of graduates for challenges of the modern labor market, as well as in the improvement of pedagogical practice.

Theoretical provisions for improving the content, forms, methods, and conditions of professional training of future specialists for the use of STEM technologies in the higher education system have gained further development.

In our opinion, the priorities in the professional training of future specialists for the use of STEM technologies in the higher education system should be the wide use of computer-oriented tools and ICT training in the educational process, the introduction of distance learning technologies, the provision of support for research work with the help of ICT, implementation of ICT in education management at various levels, in various fields, for all types of educational institutions.

The technological principles of building such an environment should be, first of all, the use of cloud computing technologies, taking into account the developers of web applications and electronic educational resources, the features of various computer and technological platforms, effective mechanisms for the use of ICT outsourcing, requirements for educational and training environments with on the part of the state, the Ministry of Education and Science, subjects of the educational process.

Strengthening of information and communication support, informational and informatics training of pupils, students and teachers should be central to the content of education; introduction of ICT in teaching and learning of all disciplines of educational institutions. To create a wide range and pedagogically balanced use of software tools

for various purposes, in particular educational and managerial, which takes into account the psychological and pedagogical aspects of building methodical systems of learning and an open computer-oriented learning environment and provides for the mandatory involvement of scientists, teachers in the creation of electronic resources, innovative teachers of educational institutions.

The specific weight of educational materials in electronic form should constantly increase.

### Conclusions

The content of the concept of STEM education is analyzed, and personal and social aspects are revealed. The main organizational forms and open online tools for the implementation of STEM education are shown. The most important functions and goals of the educational environment provided by Google services for the implementation and organization of STEM projects in higher education institutions are highlighted. The importance of a STEM-oriented approach in education is emphasized.

It has been found that for the process of higher education to correspond to the STEM concept, it is necessary to turn training towards the teamwork of the higher education students themselves, to change the usual form of teaching when the class takes place around the teacher of a higher school.

It has been proven that the method of teaching STEM education is based on the organization of creative experimental activities and practical activities. Such forms of organization of learning as learning through deliberate play, teaching by topics through innovative approaches, simulation of real experience, and clubs allow students to explore, ask questions, and solve problems. The more complex the games, which require more skills (problem-solving, social communication, etc.), the better the higher education students will be able to learn the new material.

For the effective implementation of a STEM-oriented approach in education, it is emphasized the mandatory use of educational e-platforms that satisfy the interests of students in STEM fields, influence the development of research students' creative skills and abilities; help the teacher to solve problems of motivation of students of higher education during their studies, to create in the

educational environment educational projects, creative tasks, problematic issues that will contribute to the quick and high-quality application of skills and abilities by students from all STEM educational disciplines with the help of knowledge synergy.

The most essential approaches used for the organization of STEM education are highlighted.

When implementing and creating STEM projects in institutions of higher education, it is important and necessary to use information and communication technologies, and virtual and augmented reality technologies.

The teaching of theoretical material in institutions of higher education is implemented with the help of video broadcasts, presentations, placement of text materials, etc., and the organization of scientific school excursions, laboratories, practical classes, etc., which require a special approach and require the mandatory use of virtual and augmented means, becomes a significant problem. Reality.

Introducing a STEM approach to education, despite the aforementioned difficulties, can lead to a fruitful and stimulating learning environment.

A key aspect of the STEM approach is a creative approach to teaching, creating a stimulating environment where students can develop critical thinking and apply their creativity.

Through experimental research, the importance and necessity of organizing a STEM-oriented environment in institutions of higher education was revealed, and the ways of using STEM technologies in higher education with a view to the formation of professional skills were clarified.

Methodological recommendations have been developed for the implementation of the STEM approach in the practice of the educational process, where it is necessary to organize a STEM-oriented environment in higher education institutions and create certain optimal conditions.

Disclosure of ways to provide Google services for the implementation and organization of STEM projects in higher education institutions requires further research.

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## Language analysis of free verse; The reasons behind free verse adoption

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### Abstract

This paper presents an overview of free verse and how it emerged and evolved in Arabic literature and examines the differences between free verse and standard poetry. It presents language analysis of using free verse in Arabic literature and discusses the reasons behind free verse adoption. The researcher analyzed pieces of free verse to study the reasons behind using it instead of standard poetry. The analysis includes regular rhythm or meter is not required in free verse. The movement of using free verse started by simplifying poetry rules by producing poems with a single foot or simple meter and rhyme. The analysis shows that poets used free verse because it gives them more freedom to express their thoughts, to use their personal style of musical rhythms, to use different rhythms and meters that go with their emotions and themes and to best express their poetic experiences. It also shows that free verse enables poets to use descriptive language, metaphors, historical depths elements, signs of cultural effects, new meanings without chains and to adopt words repetition as a rhetorical device meaningfully.

**Keywords:** Language analysis, Free verse, Text analysis, Arabic literature, Rhetorical device.

### Introduction

Sarumi (2015) stated, "Poetry is a literary art exploited by poets to depict life experiences as they perceive them, and to register and convey their feelings, sensations, and sentiments. It relies mostly on melody, emotion, imagery, and imagination. Poetry is one of the prehistoric arts in all nations. Among the Arabs, it particularly enjoys a prime of place among other literary arts." People use poetry to express their feelings and to present their life experiences. Poetry elements, forms, and genres differ from language to language and from period to period. (Kappeler, 2020) According to Sarumi (2015), stylistics and music are the main features that distinguish poetry from other literary genres. For example, literature researchers consider music to be the main feature to differentiate between poetry and prose. In poetry, there are external and internal melodies. The external melody, meter, and rhyme, which are the most important features of

traditional Arabic poetry, were first introduced by Khalil Ahmad Al-Farahidi. He introduced 16 meters with their corresponding feet that poets should follow in writing poems (Sarumi, 2015). In the standard form of Arabic poetry, every line in any poem consists of two rhymed metric hemistiches. Poets have license to slightly change some of the strict grammar rules or the sound rules for consonants and vowels to follow any of the sixteen meters. This change came about as a result of the exigencies of meter and rhyme as poetic necessities (Wright, 1977). In other words, language can be flexible enough to meet any poetic necessity. Hence, as Sarumi (2015) said, "classical Arab poets recognize meter and rhyme as the salient ingredients of traditional Arabic poetry." Huisman (2016) point out: 'poetry is the art shaped through language; to talk about a poem we need to talk about its language'. She examined how poetic

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language could be described and studied through linguistic theories and methods. Using language analysis during reading any poem would help us to interpret which kind of poetry we have and to what extent it could have an effect on people and society. As Shpresa, (2015) stated: 'Pragmatics allows us to investigate how this "meaning beyond the words" can be understood without ambiguity. The extra meaning is there, not because of the semantic aspects of the words themselves, but because we share certain contextual knowledge with the writer or speaker of the text'. In any language analysis, understanding meanings behind the words and cultural references help researchers a lot. Furthermore, to understand the meaning of the text correctly and its different layers, we have to look at intertextuality in the text as Ahmadian & Yazdani, (2013) suggested. Intertextuality is a framework that is used to examine the inter-connection amongst texts, it studies the text historical depth and cultural context. (Sami, Nisreen & Imad, 2017). Intertextuality is used a lot in Arabic texts and literature, so people understand it from the context. It plays a very important role in any text meanings and gives the writer more space to express their ideas referring to others. Sami et al. (2017) stated: "Investigating intertextuality especially in Arabic poetry is needed as it intensely invests metaphoric and intertextual implicates so as to preserve the original poetic aspects contributing to the aesthetics of the original texts". This article presents different free verse analysis and how it would play important role in helping writers to express their thoughts and readers to understand effectively. It is trying to show and study the reasons that make writers and poets choose to move from standard meters to free verse.

## Theoretical framework or literature review

### Free Verse and Arabic Literature

Free verse is a type or style of poetry with verses without regular set meter or rhyme scheme. It is reflection of everyday speech that could be rhyme or unrhyme in an informal way not like the traditional poetry. (Abbs & Richardson, 1990). According to them, this term could be back in history to Walt Whitman's poetry and sometimes earlier and that it was originally translated from a French movement in the 1880s *vers libre*. Then it became popular in English literature in the early twentieth century. The famous English poets who used this form are T.E. Hulme, F.S. Flint, Richard Aldington, Ezra Pound, and T.S. Eliot. (Abbs & Richardson, 1990). The most obvious characteristics of free

verse is to be free from traditional poetry chains. Allen (1948) stated "The only freedom cadenced verse obtains is a limited freedom from the tight demands of the metered line".

In Arabic poetry, a new revolutionary period in the history emerged at the beginning of the twentieth century. As a result of Western literature's influence, new genres emerged in Arabic literature in the nineteenth century; however, the strong and official recognition of these genres took place in the twentieth century (Moreh, 1968). In fact, there were early attempts to gradually free poems from the traditional constraints, as Karim (1985) stated: "there is perhaps a precedent for the use of a freer form of verse even as early as the end of the 8th century. Some poems were composed at that time based on one single foot." He mentioned many examples of early attempts by Arabic poets to simplify poetry rules by producing poems with a single foot or simple meter and rhyme.

At that time, poets started to reject the forms that had once used to write poetry; in other words, the role of meter and rhyme was no longer as strong as it had been in standard traditional Arabic poetry. Poets started to write freely without sticking to the 16-meter rules, and accordingly, as Sarumi (2015) said, "the annals of Arabic poetry have witnessed at different epochs efforts on the part of literary critics and poets to break free from the shackles and constraints of traditional poetry, all in the name of creativity, innovation, and modernity. All the attempts have thus resulted in the evolution of free verse in modern Arabic poetry." The Arabic term that is used for free verse is "*Shir hurr*," which is a literal translation of "vers libre" in French and "free verse" in English (Karim, 1985).

There are signs of innovations in almost all stages of Arabic poetry, both classical and modern. In the Abbasid period (750–1258), poets worked on new forms of meter and rhyme schemes. For example, Bashar Ibn Burd (714–783) was one of the poets who started using a new form of meter and rhyme; he was the first poet to use binary meters and rhymes (Sarumi, 2015). The *ballad* was used in the Andalusian period, which is considered, as Sarumi (2015) pointed out, a revolution in Arabic poetry structure, in which poets used new arrangements in terms of meter and rhyme. In modern Arabic literature, we could find many attempts to write free verse; one of the famous attempts was done by Ahmed Zaki Abu Shadi (1892–1955). (Moreh, 1968) Moreh described him as one of the daring Arabic poets who tried to change poetic

forms. Shadi was influenced by English literature and then by contemporary English and American poetry, as Moreh (1968) pointed out. However, Nazik Almalaiika is considered the first Arabic poet to use free verse as it is today after she wrote her famous free verse poem titled “Cholera” in 1947 (Sarumi, 2015). The free verse movement worked to liberate poetry in many ways directly and indirectly. (Fomeshi, 2022; Sleiman & Gonçalves, 2021).

Moreh (1968) mentioned many reasons that caused Arabic poets adopt free verse. First, poets wanted musical rhythm that was not limited to what he called “sonorous conventional forms”; therefore, they needed a simple, free, and personal style in poetry. Second, free verse gives poets more freedom to express their thoughts and feelings with new rhythm. Third, free verse is more flexible than traditional poetry and allows poets to choose the rhyme and meter that will best express their poetic experience. Fourth, free verse is found to be better for drama, epic, and narrative poetry since it allows poets to use different rhythms and meters that go with poets’ emotions and thoughts and enables them to use any expression to convey their themes. In short, traditional forms enslave the poet, as Moreh (1968) stated, which led poets to get rid of what he called “unnecessary chains” by using free verse.

## Methodology

In the present study the researcher employed textual analysis focusing on a text linguistic analysis to examine the reasons behind using free verse instead of standard poetry based on Moreh’s (1968) suggested reasons. The analysis includes pieces of free verse to understand the meaning of the texts and its different layers. The selected poems include Nazik Almalaiika’s “Cholera,” and Ghazi AlGosaibi’s “Oh Desert” and “When I Am Without You”, and “When the Eyes Speak”, “Our Soul” and others By Mohammed Almoqrn. The analysis focused on text analysis to examine poets’ personal styles, musical rhythms, meters, emotions, themes, poetic experiences. It also studied using descriptive language, metaphors, historical depths elements, signs of cultural effects, intertextuality, words repetition and any rhetorical device. The researcher used textual discourse analysis as a way of text interpretation of the selected texts. These selected texts interpreted in terms of the social and culture elements. To be specific textual analysis deals with the text through sense making practices. Mckee (2003) argues that “texts are the material

traces that are left of the practice of sense making the only empirical evidence we have of how other people make sense of the world”. He stated: “Performing textual analysis, then, is an attempt to gather information about sense making practices not only in cultures radically different from our own, but also within our own nations. It allows us to see how similar or different the sense-making practices that different people use can be. And it is also possible that this can allow us to better understand the sense-making cultures in which we ourselves live by seeing their limitations, and possible alternatives to them.” The researcher tries to select free verse poems that represent Arabic culture in different times some are old like Nazik Almalaiika (Aziza, 2015) and Ghazi AlGosaibi (The Guardian, 2010) others are new by Mohammed Almoqrn. The textual analysis focused on personal styles, descriptive language, musical rhythms, meters, emotions, themes, poetic experiences to examine sense-making practices.

## Results and Discussion

This section presents pieces of Arabic free verse to show how they support the reasons that Moreh (1968) mentioned as being behind free verse adoption in Arabic poetry. Some of the poems are old free verses, such as Nazik Almalaiika’s “Cholera,” and the others are “Oh Desert” and “When I Am Without You” by Ghazi AlGosaibi (Poemhunter, n/d). “When the Eyes Speak”, “Our Soul” and others By Mohammed Almoqrn. All translations are adopted from online websites.

### Cholera

By Nazik Almalaiika

It is night.  
Listen to the echoing wails  
rising above the silence in the dark  
the agonized, overflowing grief  
clashing with the wails.  
In every heart there is fire,  
in every silent hut, sorrow,  
and everywhere, a soul crying in the dark.  
It is dawn.  
Listen to the footsteps of the passerby,  
in the silence of the dawn.  
Listen, look at the mourning processions,  
ten, twenty, no... countless.  
Everywhere lies a corpse, mourned  
without a eulogy or a moment of silence.  
Humanity protests against the crimes of death.  
Cholera is the vengeance of death.  
Even the gravedigger has succumbed,  
the muezzin is dead,  
and who will eulogize the dead?

O Egypt, my heart is torn by the ravages of death.

This abridged version of “Cholera” shows how using free verse helped the poet convey her message by using simple words that describe her feelings. In contrast to free verse, words cannot stand alone meaningfully in one line in standard poetry forms. For example, in this poem, we can see words stand alone in a single line carrying different meanings, such as, “it is dawn, cholera, silence, it is night.” This could emphasize the importance of the word, which could not be used in the standard metric form. Further, the poem’s theme, “cholera,” would be difficult to present in traditional metric poem form since it is describing a daily life concern—therefore, it is more expressive to use easy-to-understand descriptive language without focusing on meters and rhythm. In her poem, Almalaika describes in detail how people have died because of cholera in her time, and she describes her feelings. Using free verse has helped her to end up with a good poem that expresses her feelings in words without affecting the meaning or style. As an example, she repeated the words “death” and “dead” more than thirty times in her poem, and that did not make the poem boring as it would have if she were repeating them in standard traditional Arabic poetry forms.

In one of her books, Nazik Almalika said that after she heard on the radio that the death rate has increased as a result of cholera, she tried twice to write poems in traditional ways to express her feelings; however, she said that these poems could not fully express her emotions and feelings. Then she gave up and wrote her poem in free verse, which, as Moreh (1968) suggested, gives poets more freedom to express their feelings. Nazik Almalika stated in her book that after she wrote her poem in free verse, she felt that she had done something great and that the poem did fully express her feelings. (Moreh, 1968)

Oh Desert  
By Ghazi AlGosaibi

I've searched the world without finding  
land more barren,  
love more pure,  
or rage more fierce than yours.  
I came back to you, oh desert,  
sea-spray on my face;  
in my mind, a mirage of tears,  
a shadow moving in the sea before dawn  
and a golden flash of braided hair.  
On my lips, two lines of poetry  
a song without echo.

I came back to you, disenchanted.  
I've found there's  
no trust between human beings.  
I came back to you deprived;  
the world's like a rib cage  
without a heart.  
Love is a word  
devoid of love.  
I came back to you defeated;  
I've been fighting life's battles  
with a sword forged from feeling.  
I came back to you...and laid my anchor  
on the sand.  
As I washed my face with dew  
it seemed you were calling me.  
Then you whispered:  
'Have you come back to me, my child?'  
Yes...mother...I came back to you.  
A child, forever grieving,  
flew to God's countries;  
unable to find his nest,  
he came back to search for his life in you.  
I came back to you, oh desert.  
I've thrown away my quiver and ceased  
wandering,  
I dally in your night-web  
of mystery,  
breathing on the soft winds of the Najd  
the fragrance of Araar.  
In you I live for poetry and moons.

Ghazi AlGosaibi (The Guardian, 2010) is a famous Saudi novelist, poet, politician and diplomat. The Guardian described him as a “Saudi politician and poet known for his modernizing spirit.” He published nearly sixty books of poems, novels, and some volumes on politics and leadership. The Guardian suggested that one of his best-known 60 books was his novel *Freedom Apartment*. He expresses everyday issues in smooth and easy-to-understand language. He wrote many love and descriptive poems. The BBC described his writing thus: “Despite his privileged background his poems reveled in images of a simpler, desert culture.” He is a liberal writer who worked hard and fought for women’s rights. All this background could tell us that he would be likely to use free verse in his poems, which he did use in some of them, although he also wrote in a standard, traditional form of poetry. All his writing was standard, not colloquial Arabic language.

In his poem ‘Oh Desert,’ he expresses his feelings and thoughts easily in a free-verse poem with no meter. He described how much he loved his home country after he traveled and lived in many countries to study and work as an

ambassador. Getting rid of unnecessary chains, as Moreh (1968) called them, has helped him to describe his feelings in words that are hard to use in metric and rhythmic poems. For instance, when he said, “the world’s like a rib cage... without a heart...Love is a word ...devoid of love,” in Arabic, the words “rib cage, heart, word, and love” are hard to use on one line in metrical poems. They vary in stressed and unstressed syllables, and they have different arrangements of consonant and vowel sounds. Repeating some words and expressions such as “came back” and “oh desert” could not have happened easily and meaningfully in a standard form of Arabic poetry. Furthermore, the poet used a descriptive metaphor: “It seemed you were calling me...Then you whispered: Have you come back to me, my child? Yes...mother...I came back to you...A child, forever grieving.” This kind of descriptive language is hard to depict in detail in the traditional standard Arabic form of poetry while keeping standard meter and rhyme.

When I Am Without You  
By Ghazi AlGosaibi

I set sail  
(although there's nothing more beautiful  
than your eyes' sea where stars meet  
where they shine with love  
and their lighthouse beacon smiles  
beaming home the voyager  
ports have denied entry  
because he tried to land passportless)  
I set sail  
searching for beautiful women  
wearing perfume, kohl, and smiles  
women who've never known joy  
But like a child's  
your face, loveliest of faces  
has never been defaced with makeup  
it still shows sorrow, hunger, fear  
smiling one moment, frowning another  
I spread my sails and wandered  
grappling with life's mysteries  
I crossed the sea of riddles and enigmas  
however you in your mind  
never wrestled with philosophy  
or searched beyond nature's bounds  
asking questions  
never pretending to knowledge  
yet knowing right from wrong  
penetrating through the fog  
of hypocrisy  
I set sail  
changed my clothes and the color of my eyes  
honed my tongue so others could understand  
me

danced to their tunes  
donned eloquence, fine manners  
shedding my old face  
But when I am with you  
I'm still the one you always knew  
as I know myself  
I show the sun my warts  
the winds my faults  
I accept myself as I am  
as your generous love accepts me.

In this poem, the poet uses a starting expression as an opening statement: “*I set sail.*” Each time he finishes describing his current emotional state, he uses the opening statement again. This style makes the meaning of the poem very deep and touching, which is hard to achieve in the traditional form of Arabic poetry. In addition, in this poem, the poet used new rhythm that Moreh (1968) mentioned in using free verse as opposed to conventional poetry. Using new music in his poem makes the meaning close to the reader, so when anyone reads or listens to the poem, they will feel as if they are experiencing the same situation of sailing and searching. Further, I think free verse helped AlGosaibi in choosing a variety of words, expressions, and vocabulary to convey his meaning effectively. For instance, some important words in the poem could not be used together to create metric and rhythmic poems, such as the words used at the beginning of the poem: “*voyager, love, smile, meet, beautiful, land.*” They have totally different stress syllables, which are hard to use in metric poems while expressing such deep meaning. In addition, free verse has enabled the poet to come up with new meanings as a result of his freedom from metric rule; as Moreh (1968) stated, free verse would make it possible to avoid what he called “the similarity in words and meaning.” I believe AlGosaibi used new meaning when he said, “However you in your mind...never wrestled with philosophy...or searched beyond nature’s bounds,” and in “I show the sun my warts...the winds my faults.” Describing inner emotions was not the way that poets usually described their curiosity, excitement, interest, love, contentment, or gratitude. I believe using free verse helped AlGosaibi come up with new meanings and thoughts.

When the Eyes Speak  
By Mohammed Almoqrn

Oh, my eye! you showed some of *their* love.  
But the most love is the one you did not show  
Ask *them* how *they* live in *our* hearts and in *our*  
eyes  
I thought that our hearts met before one year of

their actual meeting  
because of our affinity.

Do you remember us setting together before the  
dawn!

The stars were like a necklace between our  
hands.

We were speaking to the night about our story  
secrets.

The poet is Mohammed Almoqrn. He is a judge, and he works as a visiting university professor in different universities in Saudi Arabia. Although he is not studying or teaching literature, in 2014 his poetry book titled 'I speak to the night' was one of the best seller books in Saudi Arabia. The following analysis is based on selected poems from this book. In the above poem, the poet speaks about his beloved. He described how he missed her, and that life means nothing without her. What is important is that how he used language and different figure of speech which helped him to come up with very emotional love poem that people like. He used time and place reference to make strong connection between him and his memory with his beloved. The poet developed his poem around the chronotope of 'the poet's eyes and heart' as a place where his lover stays even if she is not with him, and 'the night' specifically 'before the dawn' as a time for their talking.

Using time and space references makes people feel that they are living the action and using free verse help him to convey this message. In his poem, the poet used plural pronouns instead of singular pronouns to refer to singular person such as 'their' in the first line, 'them' and 'they' in the third line; he is referring to his lover. And 'our' in the third line is referring to himself. This kind of pronouns reverse is common in Arabic language to show respect and to highlight the importance of the one that speakers or writers are talking about or addressing. It is usually used in addressing important people like kings, presidents, ministers, chairmen etc. It is also used in poetry to show how important or how much you love the one you are talking about. The poet in his poem used this kind of singular plural pronouns change to highlight the importance of the relationship between him and his beloved. This choice makes the poem's language softer and it makes the poem carries respectfulness meaning, which is the meaning that most people like in any relationship. The poet chose his words and language in a very good and clever way that hooked the readers.

The poet also used a very good strong rhythm which certainly has a strong influence on readers

as Hebron (2004) said: 'The anticipation of a rhyme word creates a sense of suspense in the reader or listener, thus adding a psychological drama to the act of reading'. He used metaphors a lot in his poems and in this poem the basic theme based on a metaphoric meaning which is 'the lover living in the poet's eyes and heart' to show how much he loves his lover and that he cannot forget her since she lives inside his eyes and heart. In other poem, he described 'pain' as if it is something growing inside us. He metaphorically describes pain as something that will continue and will never end since it grows and is still growing.

In another part, he said 'she used to end up my thirsty by love' he used metaphor to describe love as water who keeps people live. In his poem, he also said: 'I tried to collect my 'emotional' injuries, yet they spread around', this metaphor is showing how much pain he had. In one of his poems, the poet used a general metaphor 'life is a mirage'. It is a conceptual metaphor as Lakoff & Mark (2006) calls it. We could look at life and at mirage, we live them, we cannot hold both of them etc. Metaphor as Lakoff & Mark (2006) suggested structures how we perceive, how we think and what we do, so it is not a matter of language. In his poem, the poet is using people conceptual meaning that life cannot end, and that people run for it and whenever they think they achieve their goals they continue running to another one till the end of life. Lakoff & Mark (2006) stated that: 'the most fundamental values in a culture will be coherent with the metaphorical structure of the most fundamental concepts in the culture' which I found in the poems here. For example, the poet refers to future as something up, he said: '*the future is coming, and we will see and find good things.* Future in this metaphor is something in front of people. They are looking forward to finding it and to see what will happen. There is also a clear evidence of using '*good is up*' metaphor. In Arabic language, good things are usually up, which are used a lot in poems. For example, the poet said: '*happiness is rising*', '*your love rate is going up*' '*my pleasure is rising*' etc. Languages effect cultures and cultures effect languages, which will influence the way people think and behave.

Our Soul  
By Mohammed Almoqrn

Tell *those* who steal *our* souls,  
be careful.

*our* souls have to be saved  
I told the judge about *them*.

He said,  
'with love, nothing is impossible'

Again, the poet is using plural pronouns to refer to himself and his beloved. 'those' 'our' 'them' all of these pronouns are used to refer to singular nouns. It is, as I stated before, a matter of showing respect and high-status positioning. He is using *unknown voice sentences* in this poem, which is a literary style in Arabic language. It is used in written and spoken language. The unknown voice sentences style makes the reader feels that the writer speaking on behalf of him, which makes the reader live the action of the poem, novel, play etc. as if he is doing it. This style makes strong connection between the readers and the poet. It makes them read the poem in general social lens as if it is speaking generally for the whole society. Since Arabic people are in high-context culture where the way to say the words is more important than the words themselves, most poets and writers end up unconsciously using many different styles at the same time. People tend to relate things to each other to come up with the meaning or the gist.

The poet used intertextuality a lot in his poems. He used different types of intertextuality; he used it with religious texts, proverbs, previous poets or writer texts. Sami et al. (2017) defined intertextuality with religious texts as 'overlap of the original text of the poem with religious texts. On the other hand, they described literary intertextuality as: 'the existence of ancient or modern literary poetry, prose texts or figures (i.e. poets) in the text of the original poem so that the interweaved text in its fabric corresponds with the poet's own idea'. For example, in one of the poems he said: 'except in my prayer '*mehrab*' place', he used the name of the prayer place, which is a religious reference where this name '*mehrab*' is not used in everyday talk, but it is an expression from Quran. '*jannet alkhuld*' is another Quranic expression used by the poet which means paradise. In my '*right hand*' is also another religious reference expression.

The poet said in one of the poems:

Oh god what we can say  
You are so generous to us  
'Forgive us'  
That is what we need

The poet used quotation marks when he wrote the expression that means forgive us since it is intertextuality with religious texts. I think there are many religious and cultural references in the texts. One of the cultural references he used when

he said:  
Oh doctors!  
How could you protect my beloved against  
'*sukari*' !

He used the word '*sukari*' which means diabetes as a cultural reference since in Arabic people use the adjective of 'sugar' as a name of diabetes. Another example of using cultural references in his poem when he said:

The '*ful*' flower is so beautiful  
The poet referred to a specific kind of jasmine flower '*ful*' that most people like and most poets used in their poems. This expression was not used only in poetry but also in many different kinds of literary texts.

In one of his poems the poet said:  
'*Sauhil*' is that breeze is a sign of you  
or is it because of that someone is coming  
'*Sauhil*' is a name of a star that most Arab poets, both standard and colloquial language writers, used in their poems. This is a strong cultural reference and intertextuality in his text.

The poet also used intertextuality with proverbs such as when he said, '*like the round moon*'. He used this proverb which is used a lot in the ancient and modern Arabic poetry. This makes strong historical connection between people and the texts.

After analyzing his poems, we could find how the poet used his language in free verse in a way that is suitable for people culture. He presents his poems in uncomplicated language choosing good words and strong rhythm. There is historical depth in the texts and many signs of cultural effects which are clear in analyzing intertextuality and metaphors in his texts.

## Conclusions

To conclude, Andrews (2016) described free verse as "in one sense, free verse is 'free' in a counter-positional way: it has broken free from the constraints of the metrical world. Most approaches to free verse prosody see it as an aberrational type of poetry that has eschewed regular rhythms and which, nevertheless, can only be explained in terms of regular rhythm or meter." In Arabic poetry, free verse can be explained as very different from regular rhythm and meter. Free verse allows more freedom of expression and a variety of choices to represent poets' actual abilities and experiences by using easy language, intertextuality and metaphors. (Khaldi, 2020) The textual analysis concluded that free verse allows for greater freedom in

expression and make it pleasant to read. The results showed that using free verse gives poets the freedom to express their ideas and feelings. Also, it allows them to use their own personal style of musical rhythms, to use different rhythms that fit their themes and to express their poetic experiences. Free verse enables poets to use new meanings, metaphors and intertextuality effectively. It plays a key role in Arabic poetry, and as Jawad (2014) stated, “the free verse movement liberated the Arabic poem from rigidity and conventionalism.” This study has potential limitations, the sample texts could be more to represent many poets which would help to generalize the conclusion. Some suggestion for future studies is to examine those texts by using critical discourse analysis to study the social and ideological effects. Future studies could also make use of comparing languages and power on linguistically analyzing texts to see if language effects on culture, society and texts.

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## Journalism in times of war: challenges and opportunities in the digital age

### Журналістика під час війни: виклики та можливості в епоху цифрових технологій

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#### Abstract

The current conditions of journalistic activity demonstrate the importance of the ability to work properly in times of conflict and instability. The peculiarities of such work determined the purpose of the article - to study the problems of conflict-sensitive journalism as one of the trends of our time. This goal was achieved through the use of scientific methods. First of all, we are talking about the method of content analysis of professional scientific literature, the use of methods of generalisation and systematisation.

The results of the study show that for objective coverage of events, it is recommended to use the idea of a 'just' war, to carefully assess the opinions and views of different segments of the population regarding the war, not to be in the position of propagandists, to focus on the coverage of the process, to demonstrate the interests and concerns of the warring parties, avoiding the understanding

#### Анотація

Сучасні умови журналістської діяльності демонструють важливість вміння правильно працювати в умовах нестабільних ситуаціях. Особливості такої роботи зумовили мету статті – дослідити проблеми конфлікто-чутливої журналістики як одного з трендів сучасності. Цією метою було досягнуто завдяки використанню наукових методів. Насамперед, мова йде про метод контент-аналізу фахової наукової літератури, використання методів узагальнення та систематизації.

Результати дослідження свідчать, що для об'єктивного висвітлення подій рекомендується використовувати ідею «справедливої» війни, уважно оцінювати думки та погляди різних верств населення на війну, не займати позицію пропагандистів, зосередити увагу на висвітленні процесу, продемонструвати інтереси та занепокоєння

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of war as a concept of struggle for the same ideas. As shown in the article, it is important to avoid 'hate speech', which is the basis for the development of discriminatory policies. The conclusions note that journalistic work should not be understood as entertainment or selfish practice.

**Keywords:** ethics of conflict portrayal, media literariness, influence of social media, conflict-sensitive journalism, emotional intelligence.

## Introduction

Contemporary scholarly discourse has established that journalism plays an important role in covering current complex problems and tense situations in today's society. At the same time, journalism is currently undergoing serious changes due to the emergence of the phenomenon of 'media convergence', i.e. the expansion of the audience in all possible ways (Antonopoulos et al., 2020; Johnson et al., 2020). Thus, this affects the transformation of the methodology of covering events and the basic principles of journalism.

In their materials, journalists may not adhere to ethical professional principles and standards when writing about conflict-sensitive topics. At the same time, the events of the Russian-Ukrainian war have demonstrated the importance of the media in a modern democratic society (Skurtul, 2023). In times of war, there is an urgent need for accurate and high-quality information, without which democracy cannot function effectively (Zhytnikova, 2023).

On the other hand, intense competition and active transformational digital changes require journalists not only to have professional skills, but also to have a detailed understanding of the main trends in the modern globalised world. This article will examine the main aspects of conflict-sensitive journalism and its principles in modern media. Thus, given the current realities, it is necessary to comprehensively study the problem

ворогуючих сторін, уникаючи розуміння війни як концепції боротьби за ті самі ідеї. Як показано в статті, важливо уникати «мови ненависті», яка є основою для розвитку дискримінаційної політики. Розгляд елементів інтеграції соціальних медіа в журналістику показав важливість поглибленого фактчекінгу як основи роботи з цим сегментом. Водночас інструменти цензури можуть бути неефективними і їх слід замінити елементами налагодження якісної комунікації з суспільством. У висновках зазначається, що журналістську роботу не слід розуміти як розвагу чи егоїстичну практику. Через значний вплив на прийняття рішень конфліктно-чутлива журналістика має дотримуватись етичних принципів роботи, які можуть бути закріплені у відповідних нормативно-правових актах.

**Ключові слова:** етика висвітлення конфлікту, медіаграмотність, вплив соціальних медіа, конфлікто-чуттєва журналістика.

of conflict-sensitive journalism, which will determine the main purpose of the study.

At the same time, modern technologies used in modern information wars involving the media deserve important attention. All these aspects make this problem extremely relevant for study. Therefore, the main tasks include highlighting the aspects of conflict-sensitive journalism, identifying the negative effects of hate speech, and determining the updates of journalistic work with social media.

The structure of this paper consists of an introduction, a systematic review of the literature, which summarizes the main work of the authors and trends in modern journalism, results and conclusions. In the results section, the main principles of conducting conflict-sensitive journalism and its importance during the war are described. The conclusions summarize the practical features of using emotional-conflict journalism and describe directions for further research. Therefore, this study is aimed at solving a topical and not fully researched topic, and the conclusions demonstrate the importance of avoiding hate speech when conducting journalism in conditions of war.

## Literature Review

Given the above-mentioned relevance of this issue, contemporary authors have outlined the

theoretical aspects of studying sensory journalism in the digital age. Today, this area is not well represented in research. The analysis of the possibilities of sensitive messages is devoted to studies that highlight the role of empathy in journalistic material (Howard, 2015). In general, Howard's (2015) work is devoted to the theoretical concept of conflict-sensitive journalism, and the author outlines the main practical tips on how modern professional journalists should cover sensitive topics, especially in view of the conflict situation in different regions. However, the limitation of this study is a theoretical review of the basic principles of conducting conflict-sensitive journalism; however, the author does not delve into practical solutions. Changes in Ukrainian culture in the era of the Russian-Ukrainian war are also highlighted in separate studies (Kurok et al., 2023; Romaniuk et al., 2023). These studies are important in the context of this topic given the important role of Ukrainian culture and its development during the war.

As for conflict-sensitive journalism in a broader sense, this topic is present in theoretical studies that contribute to the development of methodology and monitoring of sensitivity in relation to certain groups of people (Hackett, 2012; Lipschultz, 2020). At the same time, Owino & Karani (2022) in their empirical study, based on the analysis of media reports, characterised the observance of ethical norms in modern media resources. The authors also proved that the media play an important role in conflict resolution and peace-building. The strength of the study is its empirical approach, however, the local nature of the study can be highlighted as a limitation.

At the same time, modern scholars argue that digital communications in the online environment, as well as the widespread development of audio and television media, allow for the free dissemination of any, and in some cases, inaccurate information about the actions of certain social groups or individuals (Choi & Yang, 2021). This is an important problem for modern journalism. In general, modern authors have explored various possibilities of digital journalism, in particular, the study by Antonopoulos, Konidaris, Polykalas & Lamprou (2020) analyses the phenomenon of online journalism through the prism of analysing individual news websites. The strength of this study is the empirical measurements and characterization of practical areas of journalism implementation, at the same time, this study is also local in nature, as the authors analyzed the

news websites available to them. Cheruiyot (2022) proved the importance of media literacy for the modern audience. The same problem is covered in detail in Dadakhonov (2024), who outlines the importance of media literacy based on an empirical study of this issue. Guta (2021) outlines the importance of journalistic ethics in sensitive reporting. The strength of the study is its extraordinary approach to the coverage of this problem, however, the author generally approached the chosen topic.

The development of conflict-sensitive journalism is presented in Jimoh & Kayode (2018). These authors have identified the peace journalism model as an important way for journalists to practice their craft. These authors also showed the basic background and contexts of conflicts and highlighted some peace initiatives in news coverage of conflicts. The strong point of the study is the raising of an actual topic, which is currently not fully researched. However, some of the statements made by these authors need to be revised and clarified. Thus, although contemporary studies have developed theoretical aspects of conflict-sensitive journalism, this topic is not fully covered and needs to be clarified in view of current challenges.

### Methodology

The study was conducted on the basis of a content analysis of modern scientific literature. This method allowed for a qualitative approach to this study and a comprehensive characterisation of the issue.

### Data collection

Data collection was carried out using the main scientometric databases of international and national importance in order to include a variety of sources. First, key words such as 'journalism', 'conflict-sensitive journalism', 'digitalisation', 'Ukraine', 'war', 'journalism trends' were entered into the scientometric databases. After a critical superficial analysis of the topics and annotations, the most relevant sources were selected - 50 items in total.

After that, the criteria for including the literature were formed:

1. The article deals with general trends in the development of journalism.
2. The article describes the digitalisation of journalism.

3. The main theoretical aspects of sensory journalism in the modern informative space are investigated.
4. The qualitative and quantitative data of a conflict-sensitive journalist are described.
5. Preference was given to both qualitative and quantitative research.
6. Inclusion of relevant and contemporary literature.

The date range of the sources included included literature from 2012 onwards. At the same time, the main focus was on the analysis of contemporary literature (from 2019).

### Date Analysis

The paper uses the method of content analysis of the literature, which was carried out in stages. In

**Table 1.**  
*Some aspects of implementing conflict-sensitive journalism*

Aspects	Description
Avoiding the logic of a 'tug of war'	The use of descriptions of war as a conflict between several parties fighting for the same goal is inappropriate in journalistic work. Among the negative aspects of this aspect is that its implementation leads to further escalation, the formation of competition and the denial of the need for cooperation. Usually, confrontations are not that simple. One of the important tasks of sensitive journalists is to find and analyse the activities of all stakeholders. The grouping of interested 'players' into two warring parties is replaced by exploring the interests and needs of all parties, which carry equal weight, regardless of status.
Process orientation	Conflict-sensitive journalism requires a focus on the process, not just on the coverage of events. The importance of the process is determined by the characterisation of the history of events, contexts, circumstances and conditions, coverage of the details of violence, etc.
Caution in assessing opinions and views	Caution in assessing opinions and views In the course of journalistic work, it is important to avoid generalising and presenting the opinions of the elite as the only possible and existing ones. There is a need to study the parties and their views regardless of their power and social status, and it is also important to present the views of ordinary citizens.
Understanding the injustice of war	Conflict-sensitive journalism refuses to accept narratives of a just war. Instead of discussing the possible reasons for justifying war, it should demonstrate the cost of warfare, its outcome and impact on social life, reveal the real face of war, and demonstrate the destructive impact of conflicts in the modern world.
Countering propaganda	The two-sided geometry of war coverage does not imply taking a neutral position. Using this method, a journalist must take sides. Theoretically, using rational arguments, they can counteract the other side's propaganda. However, focusing on the demonstration of violence can lead to simplification of facts and can lead to propaganda.

Source: Rudenko & Kharkov (2023), Tkhorzhevskaya (2023)

An important trend may be the use of 'hate speech'. It is widespread in public and private life, and there are many discussions about whether it is possible to regulate this issue in law. In a broad sense, hate speech means any expression that denies the existence of the principle of equality of all people. Such a construct can describe and hierarchically

particular, first, an initial analysis of the main annotations from the selected literature was carried out, and then the main results were analysed. Thus, the main trends in the development of modern journalism were identified. Also, based on the systematic method, the author characterises conflict-sensitive journalism as a phenomenon that evolves in accordance with modern globalised challenges.

### Results and Discussion

Conflict-sensitive journalism has been undergoing significant changes for a long time. With regard to the problem of implementing it in practice, researchers have identified a number of aspects that need to be taken into account (see Table 1).

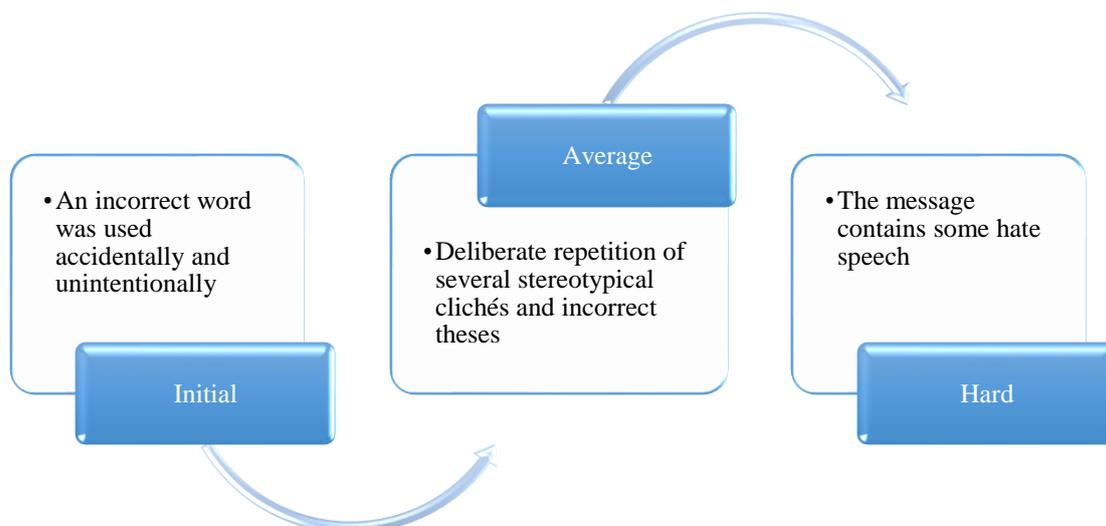
compare different groups of people and evaluate their personal qualities based on their membership in one group or another. Negative stereotypes or prejudices can become the main underlying hate speech (Nilsen, 2014). The latter are spread to justify discrimination, most often ethnic or 'racial' (Figure 1).



**Figure 1.** Elements of ‘hate speech’  
 Source: Nilsen (2014), Said-Hung, Montero-Díaz & Sánchez-Esparza (2023).

The main targets of such rhetoric may be groups of people, including ethnic groups, residents of certain territories or regions, internally displaced persons, migrants without official documents, drug or alcohol addicts, people with disabilities, representatives of certain religious groups and representatives of certain professions, which may be ambiguously treated by society. In particular, messages containing hate speech may use stereotypical names for social groups, such as Gypsies rather than Roma, Jews rather than Jews. This problem can be particularly acute in times of global challenges or conflict (Said-Hung et al., 2023).

For example, in Ukraine, many people have had to leave their homes and become displaced, and are more vulnerable and may be affected by various media headlines on displacement or refugee issues (Skurtul, 2023). In some contexts, the use of IDPs, displaced persons instead of Ukrainians, especially in topics related to their stay abroad, can be vulnerable. In particular, the news item titled ‘An IDP-coloniser detained in Lviv region’ has a negative connotation. In this context, journalists should find a line when it is really necessary to emphasise that a person is an IDP. When it does not play a significant role in the text, it is not necessary to focus on such details. Nevertheless, it is worth noting that hate speech can take several forms (Figure 2).



**Figure 2.** Forms of ‘hate speech’  
 Source: Author’s development

Thus, the use of hate speech elements may affect the professional activities of journalists. They should adhere to the Code of Ethics for Ukrainian Journalists. It is also worth remembering that crimes are committed by criminals, and not focusing on social status. Special attention in the work of journalists should be paid to the competent use of the potential of social networks and messengers, as these areas of cooperation with the public are extremely difficult to regulate through censorship or other actions of state authorities. The experience of the Russian-Ukrainian war has demonstrated that Facebook, X (formerly Twitter), Instagram, TikTok, messengers (primarily Telegram, which is popular in Ukraine) can become platforms for the rapid dissemination of information.

The ability to communicate easily, show images of destruction and casualties, and avoid unnecessary expert opinions and judgements imposed by media holdings, make it possible to show the real face of war without embellishment (Kostrubitska, 2022). Due to the efficiency and close integration of digital technologies into everyday life, information can be updated in real time, and the audience will grow exponentially. This has a tangible advantage - the ability to demonstrate the reality of military operations and the associated deprivation, pain and suffering. Moreover, this demonstration will be served directly to viewers/followers, without unnecessary censorship in most cases. However, the use of social media in journalism can also become a powerful source of disinformation.

Caught in the crossfire of disinformation, the audience on social media faces a difficult choice of trust/distrust. The situation is further complicated by paid-for content, the use of a huge number of bots that spread the desired opinions across the web, and the purchase of previously trusted accounts, which increase the risks to journalistic work. Given the possible scale of the problem, researchers believe that modern society lives in a 'post-truth' era, in which additional skills are required to detect deception. Among them is fact-checking, the ability to verify and analyse the information received. Perhaps one of the tasks of conflict-sensitive journalism is to facilitate this sector of work: journalists should independently check the materials for their relevance to reality before publishing them, making it easier for the public to identify false information.

There is also a popular opinion among researchers that journalists should understand the crucial role of journalism during military

operations (Kostrubitska, 2022). It is argued that in times of war, simply working to present information objectively or to cover opposing views is not enough, as such activities can lead to a deeper escalation and trigger new rounds of violence. Journalists in times of war are required to have more information about the root causes of conflicts, the process of conflict emergence, development and termination, as well as to be aware of the cases in which wars end and the ways in which such scenarios can be realised. Researchers acknowledge that conflict-sensitive journalism should be based on the understanding that the problem of war in the modern world is beyond the scope of any situation and has a fundamental basis that needs to be critically examined (Kostrubitska, 2022).

Therefore, when implementing the concept of conflict-sensitive journalism, there is a need to use facts that take into account broader contexts, i.e., demonstrate a holistic picture of the larger whole based on specific facts and stories that have become a complex matrix of the military present, which is constantly changing and transforming. Conflict-sensitive journalism should carry out the process of uniting society in times of war, responding to the spread of disinformation and deliberate hostility (Kostrubitska, 2022). According to current opinions in the scientific literature, even in times of military danger, journalists should provide the public with opportunities for political assessment of military realities and the consequences of war.

The findings demonstrated that modern conflict-sensitive journalism plays an important role in covering military events, informing society about the causes and consequences of wars, and taking an objective approach to reporting. At the same time, journalists should not turn into preachers of peace, but rather act as neutral intermediaries who possess and transmit objective information (Martylenko et al., 2023). Similarly, media outlets should not be subject to harassment or restrictions, but should follow the usual standards of operation that have guaranteed high quality work in peacetime.

For this reason, there is no need to impose additional restrictions on journalistic activity in times of war. On the other hand, it is worth noting the opinions of researchers that the objectivity of taking into account all points of view during wartime is a complex and partially unsolvable problem (Rudenko & Kharkov, 2023). The vivid example of Russian propaganda has demonstrated that such estimates are much closer to reality, as the free dissemination of biased and

fake information will turn journalistic work into a constant provocation of conflict. Obviously, such methods of work are not acceptable for conflict-sensitive journalism. The main trends in the development of journalism in Ukraine are covered by Karpchuk & Makar (2023) and Starkova & Yaresko (2020). Zhytnikova (2023) describes the communication capabilities of journalists in the era of war. The phenomenon of cultural journalism and its development is described in detail in a comprehensive study by Silva (2016). This author described the main models, practical solutions and opportunities of this area of journalism.

Analysis of journalistic work in the media point out that there may be several possible options for journalists in times of open war. First of all, it is about the possibility of journalists to accelerate the adoption of necessary political decisions by simultaneously drawing attention to the problem on many information resources. The reverse process is also likely, when the media can make it difficult to implement planned decisions, achieve political goals due to the degree of emotional assessment of the situation or even disclose plans for military operations (Vasilenko, 2021).

The example of the overly active PR of the counter-offensive of Ukrainian troops in 2023 clearly demonstrated the short-sightedness of journalists and experts, which led to the spread of aggression, scepticism and pessimism in Ukrainian society (Derviř, 2023). Thirdly, journalistic work can influence the formation of the political agenda (Kostrubitska, 2022). Understanding these options will allow experts to develop and formulate common standards for the presentation of events during martial law in the media. There is also a need for such principles to be enshrined at the state level in an appropriate administrative and legal act. However, given the changing situation and the active integration of new digital opportunities for disseminating information, such initiatives should be constantly adjusted to take into account the emergence of new practices that are detrimental to real journalistic work.

The findings also highlighted that hate speech can play an important role in modern journalism, which modern journalists can use both accidentally and intentionally. According to Baider & Constantinou (2020), racism in the linguistic framework is shaped by socio-cultural changes and contexts. In particular, preliminary comparisons of social media journalism about Greek Cypriots and Greek online data showed

that the two communities use different means to express their hostility towards each other, and that Greek messages may be more offensive. The findings are also consistent with Johnson, Thomas & Kelling (2020), who found that ethnicity can be an important sensitivity and resource for hate speech. Other studies also confirm that the existence of hate speech concepts is an important challenge.

In particular, based on the analysis of Spanish messages, it was determined that inappropriate translation of certain ethnic phrases can serve as a valid reason for the use of certain hate speech constructs. At the same time, contemporary scholars also agree that modern digital technologies have changed the way journalism is conducted. Contemporary scholars also identify the significant impact of these digital technologies, including multimedia for better audience outreach (Antonopoulos et al., 2020; Salaverría, 2019). However, according to Vasilenko (2021), new professional journalism in Ukraine has every opportunity to develop only if there is a public demand for it, i.e. joint efforts of scholars and practitioners are important to inform readers, viewers, listeners about new methods of presenting material and test them in modern online media.

## Conclusions

Therefore, conflict-sensitive journalism is an important tool for organising journalistic activities during military conflicts. In particular, for objective coverage of events, it is recommended to avoid certain aspects. First of all, it is about rejecting the idea of a 'just' war, being careful in assessing the opinions and views of different segments of the population regarding the war, the importance of not falling into the trap of propaganda and not becoming a propagandist yourself, focusing on the coverage of the process in assessments, demonstrating the interests and concerns of the warring parties, avoiding the understanding of war as a concept of struggle for the same ideas. An important aspect of working in conflict-sensitive journalism is avoiding the use of 'hate speech'. There are no legislative mechanisms to regulate its use, so the existence of such a construct makes it possible to characterise events and individuals with elements of denial of the principle of equality of all people. As a rule, negative stereotypes, which are the basis for discrimination, including racial discrimination, become the basic elements of hate speech.

Another important issue is the integration of modern social media into journalism. The experience of the Russian-Ukrainian war has demonstrated that online platforms have become platforms for the rapid dissemination of information. This provides conflict-sensitive journalism with an important advantage - the ability to demonstrate the real consequences of the war, which will somehow contribute to a negative perception of the war. Moreover, this demonstration will be presented directly to viewers/subscribers, without unnecessary censorship in most cases. At the same time, there is a need for in-depth fact-checking, as the availability of certain information, the spread of bots, the purchase of accounts, etc. can introduce disinformation. In such circumstances, a journalist can turn into a mediator who performs part of the tasks of combating propaganda.

It is important that journalistic work should not be seen as entertainment or a selfish practice. Due to its significant impact on decision-making, conflict-sensitive journalism should adhere to ethical principles of work, which can be enshrined in relevant regulations. However, the introduction of censorship in the coverage of modern warfare is ineffective, as it is impossible to block all channels of information dissemination, and providing truthful information is a better option than silencing tangible problems.

However, this study also opens up new directions for further research. In particular, it is important to conduct an empirical study that would confirm the effectiveness of the implementation of individual components and principles of conflict-sensitive journalism during the war.

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