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Digital technologies and information translucence in healthcare management: An institutional theory perspective for adopting electronic incidence reporting systems

التقنية الرقمية وشفافية المعلومات في إدارة الرعاية الصحية: نموذج النظرية المؤسسية لتبني نظام الإبلاغ الإلكتروني عن الحوادث

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Written by:

Ibrahim Abdullah Alhamad¹<https://orcid.org/0000-0001-7099-0335>**Harman Preet Singh**²<https://orcid.org/0000-0003-4297-0016>

Abstract

خلاصة

The purpose of this study was to provide an institutional theory perspective on the adoption of electronic IRS technology for healthcare management. This research employs institutional theory to investigate the adoption of electronic IRS for healthcare management. The study's conceptual analysis demonstrates that coercive, normative, and imitative forces influence the adoption of electronic IRS for healthcare management. International healthcare regulations and standards reflect the presence of coercive forces. International healthcare societies and professional networks mirror normative forces. Imitative forces exert pressure on smaller enterprises and developing nations to adopt electronic IRS. This research contributes to the literature and theory by extending the application of institutional theory to the adoption of digital technologies such as the electronic IRS. In addition, the study has practical implications because it demonstrates the importance of digital technologies such as electronic IRS for information translucence and healthcare management. Small businesses in developing nations can learn from large businesses in developed nations to adopt electronic IRS for efficient and effective healthcare management.

تهدف هذه الدراسة لتقديم الجانب النظري المؤسسي حول اعتماد تقنية IRS الإلكترونية لإدارة الرعاية الصحية. يستخدم هذا البحث النظرية المؤسسية للتحقق من إمكانية تبني واعتماد تقنية IRS لإدارة الرعاية الصحية. تشير للدراسة أن القوى القسرية والمعايير والمحاكاة تؤثر على اعتماد تقنية IRS الإلكترونية لإدارة الرعاية الصحية. تعكس لوائح ومعايير الرعاية الصحية الدولية وجود قوى قسرية. كما تعكس جمعيات الرعاية الصحية الدولية والشبكات المهنية القوى المعيارية وتمارس القوى المقفلة ضغطاً على الشركات الصغيرة والدول النامية لاعتماد IRS الإلكترونية. يساهم هذا البحث في الأدبيات والنظرية من خلال توسيع تطبيق النظرية المؤسسية لتبني التقنيات الرقمية مثل IRS الإلكترونية. بالإضافة إلى ذلك، فإن لهذه الدراسة تطبيقات عملية لأنها توضح أهمية التقنيات الرقمية مثل IRS الإلكترونية لشفافية المعلومات وإدارة الرعاية الصحية. حيث يمكن للشركات الصغيرة في الدول النامية التعلم من الشركات الكبيرة في الدول المتقدمة لإعتماد تقنية IRS الإلكترونية لإدارة الرعاية الصحية بكفاءة وفعالية.

الكلمات الدالة: التقنيات الرقمية، النظرية المؤسسية، شفافية المعلومات، إدارة الرعاية الصحية، أنظمة الإبلاغ عن الحوادث الإلكترونية.

Keywords: Digital technologies, Institutional theory, information translucence, healthcare management, electronic incidence reporting systems.

¹ Department of Management and Information Systems, College of Business Administration, University of Ha'il, Kingdom of Saudi Arabia.

² Department of Management and Information Systems, College of Business Administration, University of Ha'il, Kingdom of Saudi Arabia.

Introduction

Digital technologies have considerably altered the way modern institutions operate and have added significant value to business processes (Gregori & Holzmann, 2020). Digital technologies have transformed data collection, information and knowledge creation, and decision-making processes (Singh & Alshammari, 2021). Digital technologies enable dynamic decision-making in the information age (Klonoff, 2013; Gopal et al., 2018) and enable sustainable development (Singh et al., 2022a). Information translucence is one of the most significant benefits of digital technologies. Information translucence results in information availability, information clarity, decreases errors and eliminates impediments (Albu & Flyverbom, 2016). Information translucence eliminates superfluous secrecy and provides the necessary lucidity, awareness, and effectiveness (Danker, 2013). Information translucence is about accessibility, communication, cooperation, liaison, and concerted decision-making (Barth & Schipper, 2008). Thus, information translucence significantly aids professionals in the decision-making process (Winkler, 2000). As a result, digital technologies are increasingly being used in banks, educational institutions, and hospitals, among other places.

Digital technologies are transforming medical practices in the field of healthcare. Using new tools and the creation of new types of information, digital technologies enable the collection of rich and real-time medical data. They contribute to the creation of novel and distinct knowledge for healthcare management. The use of digital technologies enables the remote storage, analysis, and prediction of healthcare data. Thus, the application of digital technologies to healthcare has established itself as a critical enabler of the digital health revolution (Klonoff, 2013). Healthcare institutions can get up-to-date and streamlined information using digital technologies (Gagnon et al., 2016). Digital technologies are playing a vital role in healthcare transformation during and post COVID-19 (Wang et al., 2021; Mbunge et al., 2022; Singh et al., 2022b). Thus, digital technologies can enable effective healthcare management.

The incidence reporting system (IRS) has emerged as a crucial healthcare technology. IRS is widely acknowledged as a crucial system to facilitate healthcare learning and improve patient safety (Kumari & Singh, 2022). An effective IRS catalyzes health safety practices (Pfeiffer, 2010).

IRS gathers information regarding the safety of patients, which forms a backbone for creating learning capabilities in organizations for patient safety (Stavropoulou et al., 2015). IRS help to create new healthcare policies and practices to stop the repetition of earlier incidents (Braithwaite, 2008). Prior research suggests that IRS is utilized less due to a variety of reasons, like high workload, fear of liability, inability to judge reporting usefulness, etc. (Pfeiffer, 2010; Hwang et al., 2012). Electronic IRS overcomes many of these challenges (Uyob, 2020). The increase in adoption of the internet (Alshammari & Singh, 2018; Alhamad & Singh, 2021a) and web-based technologies (Alhamad & Singh, 2021b; Singh & Alhamad, 2021) have propelled the adoption of digital technologies in healthcare, resulting in the adoption of electronic IRS. Electronic IRS eliminates the paper-based recording of hospital incidents and avoids manual data entry delays and errors (Walsh et al., 2010). Electronic IRS can be web-based or incorporated along with an electronic health records technology (Walsh et al., 2010). Literature suggests that electronic IRS adoption improves incident reporting (Elliott et al., 2014), however, the majority of the studies have employed technology adoption theories such as user experience and social influence (Shin & Biocca, 2018), Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003; Venkatesh et al., 2016), Technology Acceptance Model (TAM) (Davis, 1989). Institutional theory can provide a novel perspective and decipher forces that lead to the adoption of digital technology like electronic IRS for effective healthcare management. However, prior research has not made enough efforts in this regard. This study endeavors to bridge these research gaps. In this research, we explore the influence of coercive, normative, and imitative forces of institutional theory on the adoption of digital technologies such as electronic IRS for information translucence and healthcare management.

Review of Literature

IRS provides critical insights into patient safety at a healthcare organization. The use of IRS in healthcare organizations is relatively recent, but they have long been utilized in other industries (such as railways, aviation, and nuclear power) (Pham et al., 2013; Allen, 2021). The IRS provides a mechanism for identifying hazards so that hospitals can take steps to mitigate them (Ramírez et al., 2018). IRS provides useful

information for identifying risks and learning opportunities for healthcare professionals (Wu et al., 2007; Laurenza et al., 2018; Tortorella et al., 2021). The traditional IRS, on the other hand, has some drawbacks, such as difficulty monitoring error rates, inability to track changes over time, development of overlapping and contradicting reports, lack of in-depth patient safety evaluations, excessive time, and cost, and so on (Padilla et al., 2019). There is evidence to suggest that traditional IRS has been less effective in reporting and reducing preventable harm (Shearer et al., 2012; Pham et al., 2013; Al-Rayes et al., 2020). Because of these limitations, healthcare providers are debating whether the traditional IRS has supported the goal of patient safety.

Traditional IRS constraints are being bypassed with the use of electronic IRS. Electronic IRS improves tracking, comprehension, and privacy of incident reporting (Elliott et al., 2014). The use of electronic IRS minimizes the number of missing incident events (Elliott et al., 2014). Electronic IRS enables decision-makers to view the status of incidents in real-time and analyze incident reports to discern incident patterns (Levtzion-Korach et al., 2009). Electronic IRS provides healthcare providers with larger access to the required information, enabling them to take remedial action (Herchline et al., 2022). Effective IRS is user-friendly and provides the necessary privacy for safeguarding sensitive patient information. Electronic IRS provides these features and results in increased patient satisfaction and improves system usability and security (Alrub et al., 2021). Electronic IRS can automate clinical processes and play a pivotal role in clinical governance (Ubogagu-Israel et al., 2022). Electronic IRS improves hospital quality management, which leads to improved patient outcomes (Hewitt et al., 2016). Electronic IRS can play a pivotal role to improve patient safety in high-risk situations and improve error resilience (Stavropoulou et al., 2015; Howell et al., 2016). Electronic IRS supports the voluntary reporting of incidents by physicians and other support staff, which can lead to significant improvement in patient safety and provide valuable insights to prevent the recurrence of incidents (Lurvey et al., 2021). Electronic IRS provides a lucid and structured framework for incident reporting and evaluation to promote patient safety (Dhamanti et al., 2020; Awad et al., 2021).

Various theories have been employed in prior research to explain the user adoption of technologies. Some popular theories include user

experience and social influence (Shin & Biocca, 2018), Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003; Venkatesh et al., 2016), Technology Acceptance Model (TAM) (Davis, 1989). However, we are interested in the adoption of technology (electronic IRS) by healthcare institutions in this study. Institutional theory can serve this research goal. So, we propose to employ institutional theory in this study.

Theoretical Framework

In the current research, we would employ the institutional theory model of DiMaggio & Powell (1983). According to this model, businesses gradually adopt similar practices and behaviors. DiMaggio and Powell (1983) identified three forces that contribute to this convergence: coercive, normative, and imitative forces. The origin of coercive forces is political power and legitimacy by businesses. They can be conveyed via legislations, rules, procedures, standardization, supervision, or compliance requirements of an external agency (Kim et al., 2016). The normative forces are associated with professional values. They can result from gaining knowledge from others through professional networks (Appari et al., 2009). Imitative forces involve emulating or copying the other's behavior. These actions result from a business's response to uncertainty (Safa et al., 2016). According to DiMaggio and Powell (1983), coercive, normative, and imitative forces shape businesses' convergence toward standardized practices and recognized behaviors. Therefore, the institutionalization of businesses is guided by coercive, normative, and imitative forces.

Teo et al. (2003) have applied the institutional model to the firm-level espousal of financial electronic data interchange (FEDI). Shi et al. (2008) have taken the institutional model and applied it to the adoption of Internet banking by individuals. Ugrin (2009) has applied the institutional model to the process of adopting enterprise resource planning (ERP) at the firm level. Sherer (2010) used the institutional model to analyze how doctors adopted electronic health records (EHRs). The institutional model was utilized by Burnett et al. (2015) to investigate how hospitals in five different European nations responded to external financial and quality demands. Singh & Alshammari (2020) applied institutional theory model of DiMaggio & Powell (1983) for developing a cyber-security legal framework.

The preceding discussion demonstrates that institutional theory has been applied to digital technologies and the healthcare industry. Therefore, we would use institutional theory in this study.

Conceptual Analysis

The previous discussion elucidates that the institutionalization of firms is guided by

coercive, normative, and imitative forces. We endeavor to decipher these forces in the international healthcare industry context.

Therefore, we employ conceptual analysis to investigate the role of coercive, normative, and imitative forces in the adoption of electronic IRS (Table 1).

Table 1.
Institutional Theory for Adopting Electronic Incidence Reporting Systems

Force	Electronic IRS Adoption Framework for Healthcare Industry (Conceptual Analysis)
Coercive	In the healthcare industry, coercive forces are reflected in international health regulations and standards. International Health Regulations (IHR), 2005 have been ratified by 196 countries across the globe and oblige countries to detect and report public health incidents (WHO, 2019). International Organization for Standardization (ISO) has developed several standards to monitor the vital signs of patients and prevent the occurrence of incidents (ISO, 2019). Healthcare professionals across the globe rely on these standards to contain incidents and provide quality healthcare. Electronic IRS facilitates compliance with international healthcare regulations and standards by healthcare institutions.
Normative	In the healthcare industry, normative forces are reflected in healthcare societies and professional networks. The most prominent international society in healthcare is the International Society for Quality in Health Care (ISQua) (ISQua, 2022). ISQua seeks to enhance the quality and security of healthcare by fostering international collaborations and soliciting the cooperation of healthcare stakeholders. ISQua has an institutional and professional network of members worldwide. ISQua promotes healthcare innovations, information translucence, digital technology adoption, and knowledge sharing. Electronic IRS satisfies these ISQua objectives, so healthcare providers get encouragement to adopt this digital technology. There are other noticeable professional networks like the global health network (GHN, 2022) and the global network for simulation in healthcare (GNSH, 2022), which encourage the adoption of digital technologies like electronic IRS.
Imitative	Developed nations have taken the lead in adopting electronic IRS while developing nations lag behind (Kumari & Singh, 2022). In developing countries, large hospitals are more likely to adopt electronic IRS than smaller hospitals. Since hospitals are part of a larger healthcare ecosystem (Aubin & King, 2018; Viswanadham, 2021), the adoption of electronic IRS by larger enterprises creates imitative pressure on smaller enterprises to do the same. Healthcare in both developed and developing nations is a component of the global healthcare ecosystem (Asakura et al., 2015), so the adoption of electronic IRS by developed countries encourages developing nations to do the same.

Results and Discussion

The electronic IRS is a crucial digital technology for healthcare management, as it facilitates information translucence, information accessibility, information clarity, and error reduction (Danker, 2013; Albu & Flyverbom, 2016). Understanding the forces that lead to the

adoption of digital technologies such as electronic IRS for healthcare management can be greatly aided by institutional theory. According to institutional theory, coercive, normative, and imitative forces (DiMaggio and Powell, 1983) influence the adoption of digital technologies, such as the electronic IRS. Therefore, the role of coercive, normative, and imitative forces in the

adoption of electronic IRS is conceptually analyzed in the present study.

The institutional theory perspective demonstrates that coercive forces are reflected in laws, rules, procedures, standardization, supervision, and compliance requirements (Kim et al., 2016). The present study's conceptual analysis shows that coercive forces are manifested in international health regulations (e.g., international health regulations (IHR), 2005) (WHO, 2019) and standards (e.g., International Organization for Standardization (ISO) (ISO, 2019). Such coercive forces lead healthcare organizations to adopt digital technologies like electronic IRS for healthcare management.

Institutional theory suggests that normative forces are mirrored in professional networks (Appari et al., 2009). The current research conceptual analysis shows that normative forces are manifested in international healthcare societies (e.g., International Society for Quality in Health Care (ISQua) (ISQua, 2022) and professional networks (e.g., global health network (GHN, 2022) and global network for simulation in healthcare (GNSH, 2022). Such normative forces encourage healthcare organizations to adopt digital technologies like electronic IRS for healthcare management.

The institutional theory posits that imitative forces manifest themselves in emulating or copying the behavior of others (Safa et al., 2016). The present study's conceptual analysis shows that imitative forces create imitative pressure on smaller enterprises (Aubin & King, 2018; Viswanadham, 2021) and developing nations (Asakura et al., 2015) to adopt electronic IRS.

Conclusions

The emergence of digital technology like electronic IRS serves the critical need for information translucence in the healthcare industry. Electronic IRS technology facilitates healthcare management, improves patient safety, and promotes health safety practices. Electronic IRS technology overcomes the limitations of traditional IRS and improves tracking, comprehension, and privacy of incident reporting. The current research employs the institutional theory model of DiMaggio & Powell (1983) to study the adoption of electronic IRS for healthcare management. The present research uses institutional theory as it has been applied to digital technologies and the healthcare industry. The present study examines the role of

institutional theory's coercive, normative, and imitative forces in the adoption of electronic IRS.

The current research conceptual analysis shows that coercive, normative, and imitative forces guide the adoption of electronic IRS for healthcare management. Coercive forces are reflected in international health regulations (e.g., international health regulations (IHR), 2005) (WHO, 2019) and standards (e.g., International Organization for Standardization (ISO) (ISO, 2019). Normative forces are manifested in international healthcare societies (e.g., International Society for Quality in Health Care (ISQua) and professional networks (e.g., global health network). Imitative forces exert pressure on smaller businesses and developing nations to adopt electronic IRS.

Implications and Limitations

The current research has important implications for theory and practice. One, it deciphers the role of institutional theory for adopting digital technologies like electronic IRS. Prior research proposes the use of technology adoption theories like user experience and social influence, Unified Theory of Acceptance and Use of Technology (UTAUT), Technology Acceptance Model (TAM), etc. in adopting digital technologies. The conceptual analysis of the current research demonstrates that organizational theory, such as institutional theory, can provide an appropriate theoretical lens to decipher coercive, normative, and imitative forces in the adoption of digital technologies such as electronic IRS. Second, the current research demonstrates the role of digital technology like electronic IRS for information translucence and healthcare management. The small enterprises in developing nations can take learnings from large enterprises in developed nations to adopt electronic IRS for efficient and effective healthcare management.

Though this study has important implications, however, there are some limitations. The study employs conceptual analysis to depict the role of institutional theory's coercive, normative, and imitative forces in guiding the adoption of digital technology like electronic IRS for healthcare management. Empirical analysis can validate the research findings. The current research employs an international perspective to build its case. However, every country can have its own set of institutional forces that guide the adoption of digital technology like electronic IRS. Therefore, future research can be conducted on a country-by-country basis and can provide a thorough knowledge of the role of digital technologies

such as electronic IRS in effective healthcare management in accordance with local conditions.

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