

Artículo de investigación

Improving cost management in the construction industry: a methodological aspect**Совершенствование управления затратами в строительной отрасли: методологический аспект**

Recibido: 12 de agosto del 2019

Aceptado: 6 de octubre del 2019

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Abstract

This paper shows that the main task of developing a business related to construction is to obtain the necessary financial result with the condition of effective cost management. It is noted that among the existing means of optimizing costs, the main ones are considered effective planning, accounting and control, as well as a number of measures aimed at reducing costs. The aim of the study was to search for innovative approaches to the formation and maintenance of management accounting in the framework of cost management, and to develop a model of the information base for cost management in the construction industry. The study used comparative analysis, synthesis of theoretical and practical material, comprehensive analysis and systematic approach. The paper considers and analyzes the problems that hinder the building of a productive cost management system for construction production. A model of the information base for the cost management of a construction organization has been formed, which involves the application of calculation of complex cost items in the accounting system, with their subdivision in analytical accounting into fixed and variable. A detailed classification of production costs is proposed and justified singling out the components of cost of work related to construction and rationalizing costs. The main features of cost calculation and the possibility of their use in order to control the cost-price were investigated. Certain aspects of rationalizing cost management are formulated and a chart of accounts for the management accounting of a construction company related to rationalizing cost management is proposed. The relevance and importance of the issue under study

Аннотация

В статье показано, что основная задача развития бизнеса, связанного со строительством, заключается в получении необходимого финансового результата с условием эффективного управления затратами. Отмечено, что среди действующих средств оптимизации затрат главными считаются эффективное планирование, учет и контроль, а также ряд мероприятий, направленных на сокращение расходов. Целью исследования явилось поиск инновационных подходов к формированию и ведению управленческого учета в рамках управления затратами, формирование модели информационной базы управления затратами в строительной отрасли. В исследовании были применены сравнительный анализ, обобщение теоретического и практического материала, комплексный анализ и системный подход. В работе рассмотрены и проанализированы проблемы, которые мешают построению продуктивной системы управления затратами строительного производства. Сформирована модель информационной базы управления затратами строительной организации, предполагающая применение в системе учета калькуляцию комплексных статей затрат, с подразделением их в аналитическом учете на постоянные и переменные. Предложена и обоснована детальная классификация производственных затрат с выделением из нее составляющих себестоимости работ, связанных со строительством и затрат рационализирующего характера. Исследованы основные особенности калькуляции затрат и возможности их использования с целью регулирования себестоимости. Сформулированы определенные аспекты управления затратами рационализирующего

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for the use of effective ways, models and cost management schemes in the construction industry are aimed at increasing the significance and optimization of construction management. The considered system of analytical cost accounting for a construction company contributes to the most thorough analysis of operational data on costs, their structure and types, classification by construction objects, responsibility centers and places of formation.

Key Words: Costs, chart of accounts, construction, cost management.

характера и предложен план счетов управленческого учета строительной компании, связанный с управлением затратами рационализирующего характера. Актуальность и важность исследуемого вопроса по использованию в строительной сфере эффективных путей, моделей и схем управления затратами направлена на увеличение значимости и оптимизации управления строительством. Рассмотренная система аналитического учета затрат компании строительного направления способствует наиболее тщательному выполнению анализа оперативных данных о затратах, их структуре и видах, классификации по строительным объектам, центрам ответственности и местам образования.

Ключевые слова: затраты, план счетов, строительство, управления затратами.

Introduction

In the present conditions, competitiveness in the market depends, first of all, on the speed of implementation of various innovative technologies at the enterprise and the ability to offer new products and services, which differ in quality and cost from competitors' products and services.

In order to maintain and increase the established profit volume under such conditions, it is necessary to reduce the price of products or services maintaining certain quality standards (Butler and Ghosh, 2015).

The economy of the present contributes to the most effective implementation of cost management in companies. With increasing competition in the target market segment, the rate of return decreases. As a result, the chances of enterprise development are directly dependent on the behavior of costs and the ability to manage them.

The information provided by an effective cost management system contributes to the most accurate justification of management decisions, in comparison with unpredictable decisions (Kotova, 2016; Gerasimova, 2017).

The relevance of the issue of cost reflection in data generated for the purpose of management is evidenced by an active discussion of this problem among scholars studying methodological tasks, approaches, goals, directions in the theory of management accounting, as well as methods for effectively ensuring cost accounting in the wide

practice of different companies (Butler and Ghosh, 2015; Chopra, 2013; Garrison et al., 2011).

A very important problem in creating an optimal cost management model is that the current system of cost accounting and costing does not include the interaction between the content of any costs, the sources of their emergence within the organization and the actual or target results for the implementation of which these costs were directed (Panchenko, 2017; Gerasimova, 2017). From this point of view, it is considered reasonable to introduce a search for innovative approaches to the formation and maintenance of management accounting in the framework of cost management.

Now, let us proceed to the features of the use of management accounting in the construction industry. Many theoretical and practical publications on financial accounting, cost accounting and costing and cost management, as a rule, consider the fact that accounting is substantially interconnected with the type of company activity, its scope, features of technologies and production processes, ways of organizing activities, the variety of goods and other factors (Davison, 2015; Dombrovskaya, 2016; Akimova, 2018; Parker, 2012; Qu and Cooper, 2011).

However, the study of this topic, as a rule, comes to an end. The regulations do not mention the consideration of these features in the construction sector, which is characterized by

specific economic relations, justified by the standard existing order of relations between participants in the investment sphere (Norton and Wanderley, 2016; Konchitchki, 2011; Canning and O'Dwyer, 2016; Dombrovskaya and Mamonova, 2015; Gerasimova, 2015).

Employees of construction companies work for particular customers, entering into relationships with them that are not related to the purchase or sale of products, as happens in industrial companies in the process of purchasing goods (Schleicher, T. and Walker, 2015).

The organization of cost management in the construction sector needs to provide relevant information to all subjects of investment activity, and, first of all, to construction companies-contractors, which today absolutely do not have the ability to carry out economic analysis and diagnose the synthetic components of the cost of construction services, since these components do not correspond to the generally accepted classification of costs taken into account in the estimated costing of construction works (Kim, 2014).

For the implementation of management accounting, construction companies need to carry out a number of global changes in the accounting system and in the formation of estimates for the construction of facilities.

Purpose, objectives and research methods

The purpose of the study is to develop an effective mechanism for accounting and analytical support in the management of costs in construction organizations, which makes it possible to make optimal management decisions. Research objectives are: to analyze the problematic issues associated with the cost management in construction organizations; taking into account the results of the analysis, develop a methodology for identifying the typology of costs, to highlight rationalizing costs; to develop an algorithm for setting accounting for rationalizing costs.

The hypothesis of the study is that the development of management accounting methods involves clarifying the information base of cost management, developing on this basis some methodological approaches to the formation of intra-company standards, developing a cost management methodology of a rationalizing nature and a chart of accounts for management accounting of a construction company related to rationalizing costs

management, the formation of methodological approaches to the organization and functioning of the management system in construction organizations through the consideration of promising areas of development of management accounting based on the implementation of a systematic approach that contribute to increasing the transparency of management information.

The dialectical method as a general approach to the academic cognition of the studied subject is the methodological basis. During the study, the academic apparatus of management accounting was used, standardized methods for evaluating and analyzing various data were applied (methods of comparison and system analysis, grouping, index analysis).

Results and discussion

To date, the range of the items of production costs and the cost of calculating the cost-price of construction and installation works are formed by companies themselves, based on the requirements of leadership at various stages of management. In other words, the leaders of construction companies must solve for themselves the issues associated with that.

The task of building a model of the information base for cost management in the management accounting of a construction company is to provide separate cost accounting in the framework of construction work at the sites in areas that are interconnected with:

- The optimal level of specification of costs;
- The use of effective methods of cost accounting;
- The appropriate distribution of indirect costs (Figure 1).

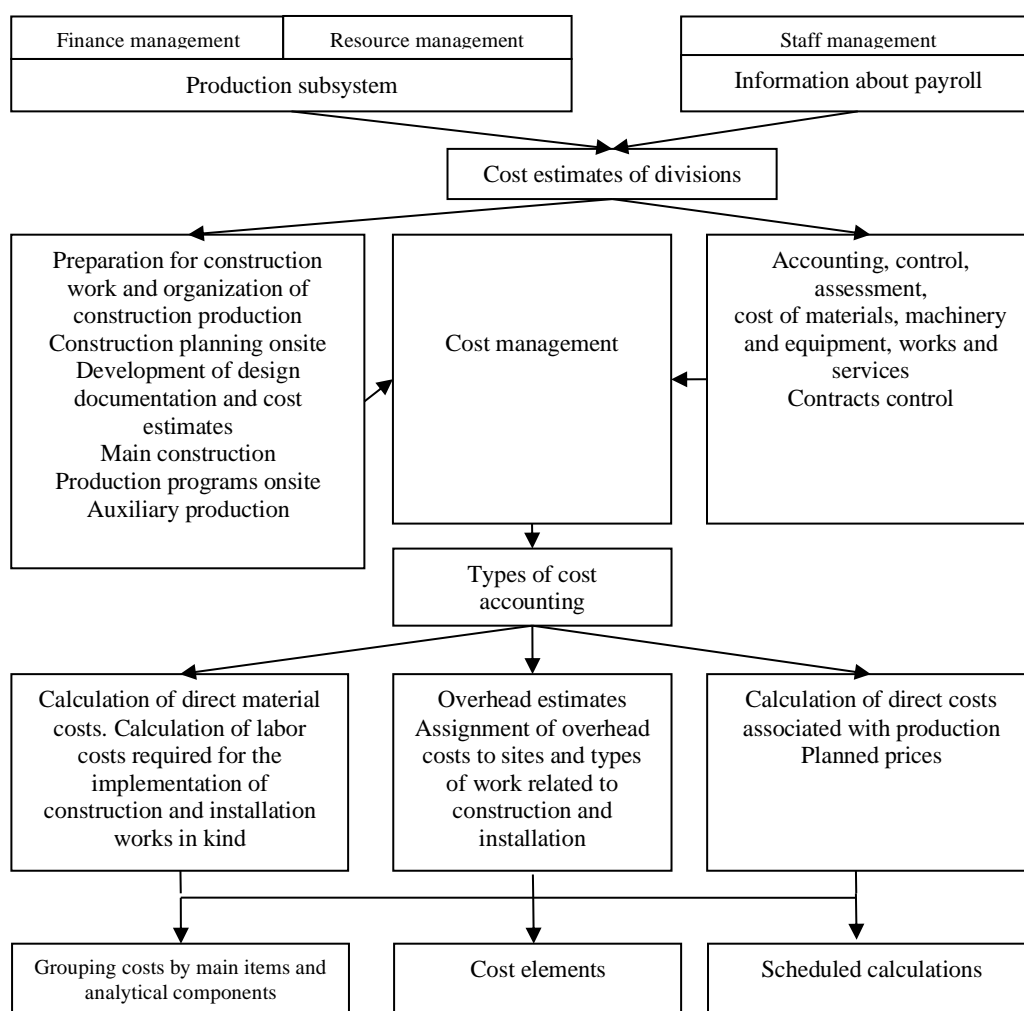
The cost of work related to construction, which construction companies carry out on their own, consists of the cost of raw materials, fuel and energy resources, fixed assets, labor and other resources used in the production process (Parker, 2012; Kim, 2014).

For this reason, it is necessary to apply the calculation of cost items as a whole in the accounting system, and subdivide them in analytical accounting into variable and fixed. For this purpose, it is necessary to carry out a restructuring, taking into account the most detailed classification of production costs and separating from them certain components of the cost of work related to construction. For instance:

- In materials, to single out the costs for secondary and auxiliary production and transport-procurement and storage costs;
- In wages, to divide the costs by time-based, piece-rate and time-bonus forms of remuneration of staff, their constant salary;
- In other costs – the operational cost of machinery equipment, including remuneration of employees of the company involved in the operation of machinery and equipment, such as mechanics, machinists and others, other than depreciation costs and fixed overhead costs.

An approximate grouping of costs for managerial purposes is considered in Table 1.

According to analytical accounts, the costs should be accounted for all cost components separately: the basic salary of personnel, fuel and energy resources, which are part of the operational cost of construction machinery and mechanisms, and overhead costs. It is especially necessary to separate them into variable and fixed costs. The formation of analytical accounts is carried out by responsibility centers and sites. Regarding the chart of accounts, diversified and dominant costs are accounted for in the same accounts as in accounting, and for rationalizing costs, the accounts 30+ that are not used in the chart of accounts should be used.



Source: compiled by the authors

Figure 1. Model of the information base for cost management of a construction organization

It should be noted that when building a model of the information base for managing construction costs, the issue of their classification for the modernization of internal accounting and

calculating the cost of construction is investigated. An example of the classification of construction costs is considered in Figure 2.

Table 1. Grouping of costs for management purposes

Company's costs	Examples of main cost items	Examples of analytical accounts
Dominant	Material	Basic (interior paints and varnishes; porous slag crushed stone; oil-glue putty; drying oil; ready-mixed cement mortar for masonry; sand for construction; galvanized sheet steel with sheet = 0.7 mm; finished cement-lime mortar for finishing work). Auxiliary (nails; wire rope made of galvanized steel d = 5 mm)
	Payroll	Basic wages (salaries). Bonuses paid once a quarter. Supplement for the length of service. Payment of holidays with an average duration of 28 calendar days
	Maintenance costs of mechanisms, machinery and equipment: earth-moving machinery (bulldozers and excavators); lifting equipment (cranes); others; transport	Salary of mechanics, machinists, engine operators and other workers involved in the control of machinery and equipment. Material costs, including fuel and energy resources for operational purposes. Depreciation for the restoration of machinery and construction equipment. Maintenance and diagnostics of construction machinery and equipment. Relocation of construction machinery and equipment
Dominant	Capital	Construction work related to the installation of equipment. Cost of equipment (requiring or not requiring installation) provided for in estimates for the construction work. Price of tools and equipment. Other capital works and costs. Costs that do not increase the value of the object Drawing up design documentation and estimates for construction works Laying temporary access roads. Laying power lines.
	Indirect	Transportation of equipment to the construction site Delivery of drinking water and food Purchase of workwear Organization of protection of construction sites. Obtaining a license and further land reclamation Insurance contributions to extrabudgetary funds. Mandatory contributions to the Social Insurance Fund from injuries and industrial accidents, and occurrence of occupational diseases.
Diversified	Other	Rental of premises. Travel expenses. Communication services. Rental and maintenance of vehicles Search for customers, profitable partners and investors.
	Transaction	Guarantees at the conclusion of transactions. Negotiation. Conclusion of contracts. Costs of the fulfillment of obligations under contracts. Adaptive contingency R&D
	Innovation	Elimination of obsolete fixed assets. Development of innovative construction technologies
Rationalizing	Market	Cost of inflation. Costs of services related to mediation. Costs of incoming resources purchased from third parties. Costs of the study of market conditions. Competitors' expenses. Costs of promoting new construction technologies
	Ecological	Preventive repairs. Development of measures aimed at

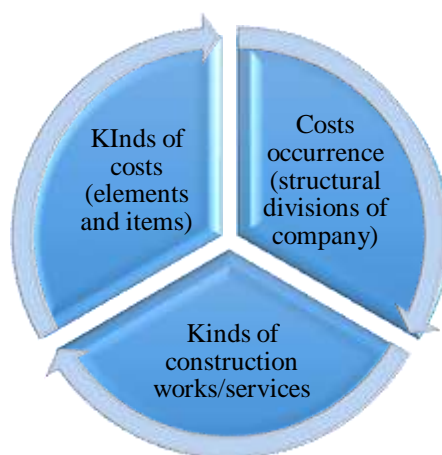
HR	protecting nature Insurance of production facilities of increased danger. Disposal of hazardous industrial waste Costs of technologies for incineration of solid waste Training young specialists, improving their skill level. Costs associated with staff reductions. Costs needed to motivate employees to invent and innovate Costs required to achieve personal performance indicators by employees. Costs of achieving industry-average salary
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Source: compiled by the authors

It should be noted that when building a model of the information base for managing construction costs, the issue of their classification for the modernization of internal accounting and calculating the cost of construction is investigated. An example of the classification of construction costs is considered in Figure 2. An example of the content of the cost items of the planned cost estimate of construction work for the approval of the amount of investment is considered in Table 2.

Let us analyze certain aspects of rationalizing costs management.

The standard approach to cost management is being replaced by the innovative method. For this, new criteria for classifying costs are introduced, taking into account integrated strategies and a systematic approach to the difficulties of market activity, which should increase the level of customer satisfaction, the quality of the technology used, the optimization of the nature of the resources used, and the fruitfulness of the processes of professional operation.



Source: compiled by the authors

Figure 2. Example of classification of construction costs

The popular separation of costs into variable and fixed ones seems erroneous in the case of rationalization of management decisions, so they need to be distributed within a certain time range.

According to the authors' approach, rationalizing costs is expedient when their occurrence is associated with an increase in indicators and an improvement of the quality of company's activities.

Table 2. An example of the content of the cost items of the planned cost of construction work to agree on the amount of investment

Cost item	Reason
Search for customers, profitable partners and investors	Federal Act dated April 5, 2013 No. 44-FZ (as amended on June 27, 2019) "On the contract system in the field of procurement of goods, work, services to meet state and municipal needs" as amended on July 31, 2019
Business negotiations and conclusion of contracts	Federal Act dated April 5, 2013 No. 44-FZ (as amended on June 27, 2019) "On the contract system in the field of procurement of goods, work, services to meet state and municipal needs" as amended on July 31, 2019
Projects development	Estimates for the implementation of work related to the draft projecting
Costs of inflation	Estimated standards established by the state and local authorities
Costs of obtaining permissions and making cost estimate	Contract with a design agency, calculation of the cost of work related to budgeting and obtaining permissions
Costs of achieving industry-average salary	Article 133.1 of Chapter 21 of the Labor Code of the Russian Federation. Determining the minimum wage in the constituent entity of the Russian Federation Average salary in the industry according to the Federal State Statistics Service (Rosstat) Calculations of the actual average salary according to the data of the Federal Tax Service of the Russian Federation
Construction and installation works (CIW), including:	
Material costs	Calculation and planning of indicators associated with the consumption of goods and materials
Costs of maintenance of construction machinery and equipment	Calculation and planning of indicators related to the maintenance of construction equipment and machinery
Construction labor costs	50 percent of the amount of material costs
Overhead costs	15 percent of payroll
Costs associated with keeping of owner's/developer's service	Estimated costs associated with keeping of owner's/developer's service
Costs of equipment installation	Calculation and planning of indicators associated with the installation of equipment

Source: compiled by the authors

An example of these indicators is: an increase in the life of the company simultaneously with an increase in the market share and value, an increase in quality, security and a better perception by the consumers of the services provided, the development of innovative areas in professional activity.

Costs can be classified taking into account transaction costs, innovation, market conditions, as well as costs to support the environment. In Table 3 the authors consider the chart of accounts for the implementation by a construction company.

Table 3. Approximate chart of accounts of management accounting of a construction company associated with the management of rationalizing costs

Name of account	subaccount	analytical account
30 Planned costs	Transaction costs Innovations	Types of costs. Responsibility centers.

	Market costs	Budgets.
	Ecological costs	Innovation projects
	HR	
	Business relations	
	Guarantees of transactions	
31 Transaction costs	Business negotiations and conclusion of contracts	Responsibility centers. Innovation projects
	Fulfillment of contractual obligations	
	Contingency	
	R&D	
32 Innovations	Funds liquidation	Responsibility centers. Innovation projects
	Creation of new facilities	
	Market research	
33 Market costs	Advertising innovative products	Responsibility centers. Innovation projects
	Intermediaries	
	Equipment repair and maintenance	
	Nature conservation activities	
34 Ecological costs	Insurance payments	Responsibility centers. Innovation projects
	Disposal costs	
	Sewage water treatment costs	
	Solid waste incineration costs	
	Training costs	
	Costs needed to motivate employees to invent and innovate	
35 HR	Costs required to achieve personal performance indicators by employees	Responsibility centers. Innovation projects
	Investments in staff reductions	
	Transaction costs	
	Innovations	
36 Rationalizing costs	Market costs	Responsibility centers. Innovation projects
	Ecological costs	
	HR	
	Optimization of internal processes	
37 Deviations of rationalizing costs	Staff development	Responsibility centers. Innovation projects
	Strengthening market positions	
	Costs of inflation	

Source: compiled by the authors

It should be noted that in order to manage rationalizing costs, it is necessary to fix their planned level, the size of which is supposed to be taken into account on the debit side of a/c 30 (Planned costs) in correspondence with a/c 31, 32, 33, 34 and 35. On the debit side of the above accounts, in this case, the fact of the level of rationalizing costs will be reflected in the correspondence from a/c 02, 05, 10, 60, 66, 67, 68, 69,70, 76.

The effect of this accounting should be manifested in the ratio of rationalizing costs according to the plan and in fact, as well as in the accounting and analysis of deviations, accounted for separately on the a/c 37 (Deviations of rationalizing costs).

If a negative cost deviation is recorded, that is, an excess of the fact over the plan, a record is made on the debit side of a/c 37 and the credit side of accounts for rationalizing costs. A positive deviation of costs, that is, an excess of the plan over the fact, must be reversed.

Therefore, the authors relate the setting of rationalizing costs accounting to the use of such management accounting tools as:

- Balanced targets, on the basis of which it is required to specify and digitize strategies and goals for each critical section of the company's professional activity;
- Budget strategic plan, which is implemented taking into account the

secondary budget strategy with specific target values and non-financial parameters, focused on import into the system of the standard budget plan;

- Employee motivation is an important resource of the organization, which helps to direct staff to achieve the goals of the enterprise.

The leadership of the organization must accurately evaluate strategic information, which is the analytical base for approving managerial decisions, including taking into account the particularities of costs and the choice of grouping them in constantly changing business conditions. Only if there is a strategic approach to such problems, is it possible to achieve the profitability of the company, the availability of the necessary resources and their rational use.

Conclusions

In general, on the problem under study, one can conclude the following:

1. Cost management is an activity in the field of successful management, a tool for achieving high economic performance by a company. The specificity of this activity is expressed in the aggregate of often unrelated knowledge about the company's operation. There is a relationship: the final result – the operation of the company – income. This activity is not only associated with cost reduction; it can concern all components of the management process.

Consequently, the management of production costs, in particular in market conditions, is considered a key goal of the entire management system of the company, since it is here that all the information about actual costs is accumulated, and, therefore, the basis for generating actual income is formed.

2. The importance of construction management is increased due to the relevance and importance of the issue under study on the use of a cost management information base model in the construction industry. Recommended changes in accounting to increase its information content will mobilize all hidden reserves and potential in the management of construction activities, and will contribute on the basis of this to real

savings in construction costs and, naturally, to the cost of construction projects.

3. The considered system of analytical cost accounting for construction companies contributes to the most thorough analysis of operational data on costs, their structure and types, classification by construction objects, responsibility centers and places of formation. The ability to use this system is created by modern accounting and management computer software that allows analyzing data in detail according to various criteria.

In conclusion, it is worth noting that only the right cost management in the current conditions of an unstable economy and fierce competition will allow the company to effectively carry out financial and economic activities. The above issues are particularly relevant and need further research.

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