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Theoretical and Methodological Foundations of Cost Management for the Production of Building Materials

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ABSTRACT

Cost control is of particular importance in modern market conditions, as the effective regulation of expenditure activities directly impacts product cost, the enterprise's financial results, and its capacity for innovative development. Currently, Ukraine virtually lacks a holistic and systematic cost control model that defines corporate policy for rationalizing resource-intensive activities. The research aim is to study the theoretical and methodological foundations of cost management for the production of building materials. The scientific article defines the key organizational conditions for the production of building materials. It outlines the main elements of the production cost control system, which include: cost regulation, strategic cost forecasting, integrated resource planning (ERP), adaptive resource normalization, operational economic analysis, process-oriented costing, deviation control and real-time response, cost optimization, cost auditing, feedback, and corrective management. The analytical elements of the cost management system during the production of building materials are presented as follows: cost forecasting and planning; cost normalization; cost calculation; cost accounting; cost and cost price analysis; and control and regulation of the cost management process. Cost accounting is carried out in accordance with a defined nomenclature of cost items, within which the accumulation and allocation of costs by costing objects are reflected. Particular attention is paid to the precise determination of the actual cost price of products based on classification approaches (by economic content, cost items, place of occurrence, etc.), which is critically important for construction-profile enterprises. The methodological essence of the cost management system lies in forming a comprehensive mechanism for integrating the processes of supply, consumption, control, and regulation of resource flows in accordance with established strategic and tactical objectives. The key characteristics of such a system are purposefulness, flexibility, adaptability, manageability, and the ability to transform under the influence of external and internal factors.

KEYWORDS

costs, cost management, cost accounting, construction, building materials.

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СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

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Теоретико-методологічні основи управління витратами на виробництво будівельних матеріалів

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СТАТТЯ

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АНОТАЦІЯ

Контроль витрат набуває особливої ваги в умовах сучасних ринкових відносин, оскільки ефективне регулювання витратної діяльності безпосередньо впливає на собівартість продукції, фінансові результати підприємства та його інноваційний розвиток. На сучасному етапі в Україні практично відсутня цілісна і системна модель контролю витрат, що визначала б політику компаній щодо раціоналізації ресурсозатратної діяльності. Метою дослідження є вивчення теоретико-методологічних основ управління витратами на виробництво будівельних матеріалів. У науковій статті визначено ключові умови організації виробництва будівельних матеріалів. Наведено основні елементи системи контролю виробничих витрат, що включають: регулювання витрат, стратегічне прогнозування витрат, інтегроване планування ресурсів (ERP), адаптивне нормування ресурсів, операційний економічний аналіз, процесно-орієнтоване калькулювання, контроль відхилень і реагування в реальному часі, оптимізація витрат, аудит витрат, зворотний зв'язок та корекційне управління. Наведено аналітичні елементи системи управління витратами в ході виробництва будівельних матеріалів, а саме: прогнозування і планування витрат; нормування витрат; калькулювання собівартості; облік витрат; аналіз витрат і собівартості; контроль і регулювання процесу управління витратами. Облік витрат здійснюється відповідно до визначеної номенклатури калькуляційних статей, у межах якої відображається накопичення та розподіл витрат за об'єктами калькулювання. Особливу увагу приділено точному визначенню фактичної собівартості продукції на основі класифікаційних підходів (за економічним змістом, статтями калькуляції, місцем виникнення тощо), що є критично важливим для підприємств будівельного профілю. Методологічна сутність системи управління витратами полягає у формуванні комплексного механізму інтеграції процесів постачання, споживання, контролю і регулювання ресурсних потоків відповідно до встановлених стратегічних і тактичних завдань. Ключовими характеристиками такої системи виступають цілеспрямованість, гнучкість, адаптивність, керованість, а також здатність до трансформації під впливом зовнішніх та внутрішніх факторів.

КЛЮЧОВІ СЛОВА

витрати, управління витратами, облік витрат, будівництво, будівельні матеріали.

1. Introduction

In the current market environment, cost control acquires paramount importance, as the effective regulation of expenditure activities directly impacts the product's cost price, the enterprise's financial results, and its potential for innovative development. This is particularly relevant for the production of building materials, which is characterized by high resource intensity, a significant proportion of material costs in the cost price structure, and the need for rapid response to price instability in raw materials and energy carriers. Cost control is a dynamic and multi-component management process that integrates a complex of measures aimed at achieving the enterprise's strategic and operational economic goals. This process is not limited merely to cost reduction but encompasses the entire spectrum of control tools that ensure effective cost management in real-time.

The relevance of the study is amplified by the fact that in contemporary Ukraine, amidst the recovery and development of the construction industry, a holistic and systematic model of production cost control is virtually absent, which would ensure the rationalization of resource-intensive activities specifically within this sector. Therefore, there is an urgent need to develop and theoretically substantiate methodological foundations capable of ensuring the integration of strategic forecasting, adaptive normalization, and process-oriented costing.

2. Literature Review

Effective cost management is a critical factor for ensuring the competitiveness and financial stability of enterprises, particularly in the production of building materials, where pricing policy and production resource intensity play a decisive role. The need for rational resource utilization and the continuous search for ways to optimize cost price amidst inflationary pressure and market uncertainty requires an in-depth study of theoretical and methodological developments. The presented literature review reflects the evolution of scientific views on cost management, spanning from integrated accounting systems to modern models oriented towards the product life cycle and production processes.

R. Kaplan and R. Cooper (1998) examine the concept of integrated cost management systems, particularly Activity-Based Costing (ABC) [1]. The authors explain how to account for costs more accurately and improve profitability, providing examples of implementing modern costing systems in enterprises.

The work of L. Koskela (2000) lays the theoretical groundwork by exploring production theory and its application in construction [2]. The identified production principles, notably the concepts of Lean Construction, are key to developing a methodology for managing costs in the manufacturing of building materials. This allows for the optimization of production processes, the minimization of resource and raw material losses, and increased efficiency.

I. Davydov (2001) analyzes the role of cost management in increasing enterprise operational efficiency [3]. The author emphasizes the importance of optimizing cost processes in contemporary conditions, reviewing methods for cost reduction and providing recommendations for improving financial results.

O. Krushelnytska (2008) studies the effective management of an enterprise's material resources [4]. The methods for planning, normalization, and control of material flows are considered. The author focuses attention on minimizing costs associated with supplying resources to production.

The research by M. Hanid (2014) uses the Design Science Research approach to develop conceptual solutions aimed at improving cost management in construction [5]. These solutions can be adapted to create new effective models for controlling production costs related to raw materials, energy, and labor in building materials manufacturing.

The work of A. Ashworth and S. Perera (2015) present the basic knowledge and methodologies for conducting building cost studies [6]. These approaches are fundamental for accurate planning and control of costs for the procurement and use of building materials within the total construction cost structure. Understanding these principles is essential for developing a methodology for managing production costs.

R. Antunes and V. Gonzalez (2015) develop a theoretical foundation for a production model in construction [7]. This framework is important for identifying and systematizing all production processes involved in manufacturing building materials. A structured approach to production modeling directly impacts the accuracy of accounting and the effectiveness of cost management.

A. Kazaz et al. (2016) propose a methodology, oriented towards building materials, for solving time-cost-quality trade-off problems [8]. This approach is critically important for managing materials production costs, as it allows for finding the optimal balance between the product's cost price and the necessary technical characteristics.

The study by N. Bozgulova et al. (2019) focuses on calculation methods applied to cost management in the construction industry [9]. The authors examine specific methodologies that can be implemented directly in the production of building materials, ensuring precise accounting and control of their cost price formation.

K. Mamonov and V. Troian (2019) analyze theoretical and methodological approaches to brand assessment of construction enterprises [10]. Although the work does not directly address production costs, it highlights the importance of intangible assets, which influence the market value of building materials and the overall economic effectiveness of enterprise cost management.

I. Markina et al. (2020) investigate theoretical approaches to enterprise cost management [11]. The authors analyze modern models, principles, and factors influencing the cost mechanism, considering the importance of rational cost management in a competitive environment.

L. Gerasimova (2020) focuses on improving cost management in the construction industry from a methodological perspective [12]. The work suggests specific ways to enhance existing methods, which is crucial for developing effective theoretical and methodological foundations for cost management, helping to improve the economic justification of production management decisions.

S. Uvarova et al. (2023) examine the methodology and practice of cost forecasting for building materials under conditions of uncertainty [13]. The research results are important for including elements of strategic planning and risk management in the methodological foundations of production cost control, ensuring enterprise sustainability in an unstable market.

J. Smetanková et al. (2024) explore the theoretical foundations and impact of technological progress on the Life Cycle Costing (LCC) of buildings [14]. This approach is key to forming management decisions in the materials production sector, shifting the focus from initial costs to the overall economic efficiency of the product throughout its service life.

Despite significant scientific achievements in cost management and its integration into the construction industry, most studies emphasize general models (ABC, LCC) and Lean Construction principles, often overlooking the creation of a holistic and systematic cost control model adapted to the specifics of Ukrainian building materials production. In particular, issues of cost price formation in contemporary conditions and the comprehensive functional provision of control in both preventive and operational modes of influence on production activity remain insufficiently researched, which is critical for correcting deviations from planned parameters. In fact, a clear system for managing the cost optimization process is still absent in Ukraine, complicating the implementation of effective cost policy under increasing inflationary pressure. Thus, the task of developing theoretical and methodological foundations that integrate strategic forecasting, adaptive normalization, and process-oriented costing into a single mechanism for improving enterprise economic efficiency remains relevant.

3. Problem Statement

The study aims to examine the theoretical and methodological foundations of cost management for the production of building materials. To achieve this goal, it is necessary to analyze the main theoretical provisions and systematize the analytical elements of the cost management system. This will allow for the formation of a holistic and systematic cost control model for rationalizing the resource-intensive activities of building materials producers.

4. Methods and Materials

The following scientific methods were used in the research: analysis and synthesis to study the cost components in building materials production and to generalize theoretical approaches to their

management; abstraction and generalization to highlight the essential characteristics of the cost management process and formulate theoretical and methodological provisions; comparative analysis to assess the differences in cost management approaches across various enterprises in the building materials industry and identify the most effective practices; a systemic approach to ensure a comprehensive view of the cost management system as an interconnected set of production process elements; structural-logical method to build a logical scheme of cost management and determine the place of each element in the overall system; and the expert evaluation method to identify the key factors influencing cost formation and assess the effectiveness of management decisions.

5. Results and Discussion

The key challenge in cost control lies not so much in the absolute accuracy of determining the product's cost price, but in understanding the mechanisms of its formation, and in ensuring control functions in both preventive and operational modes of influence on the enterprise's production activity, aiming to correct deviations from planned parameters. Domestic cost management practice during Ukraine's independence faced significant difficulties due to insufficient attention to cost price formation, which negatively affected the methodology of planning, accounting, and analysis of production costs. As a result, scientific and technical developments created in previous periods were lost, significantly limiting the competitiveness of national enterprises [15].

Production costs serve simultaneously as both an object and a subject of management in the enterprise economy at the micro-level, being an integral part of management accounting. However, at the current stage in Ukraine, a holistic and systematic cost control model is virtually absent, which would determine corporate policy for rationalizing resource-intensive activities. It should be noted that the lack of a clear system for managing the cost reduction process complicates the implementation of an effective cost policy. Increasing inflationary pressure only exacerbates this problem, as the primary source of company profit is often associated with raising selling prices rather than optimizing production costs.

Modern production operates under multifaceted constraints, determined by the psychological characteristics of employees, the level of scientific and technical innovation implementation, and the quality and quantity of labor resources and the enterprise's material and technical base. To achieve productivity goals, a comprehensive analysis of the economic efficiency of the enterprise's operations is necessary, including the evaluation of each structural unit's activities. Such analysis is implemented through a control system that covers the quality, productivity, and profitability of various types of products [1].

The effectiveness of enterprise management largely depends on the organization and level of control over production costs. Figure 1 illustrates the main elements of the cost control system, including cost regulation, strategic cost forecasting, integrated resource planning, adaptive normalization, cost accounting, process-oriented costing, operational economic analysis, deviation control and real-time response, cost auditing, feedback, and corrective management, where these components interact within a single cost management mechanism [16].

In critical operational conditions for the enterprise and when the industry's existence is threatened, management increasingly realizes the need for rational resource utilization at every stage of the production process, especially in the context of constantly rising prices for materials and energy resources. A significant number of enterprises have the potential to reduce costs to an optimal level, ensuring increased economic efficiency and competitiveness.

Cost control has an integrative nature, combining the methodological aspects of cost management and the overall operational efficiency of the enterprise, focusing on the final financial result – profit [16]. Some scholars support the position that cost control allows not only for a more precise determination of actual cost levels but also for identifying reserves for their reduction. At the same time, the control process must be purposeful, oriented towards operational intervention in management processes, ensuring timely correction of deviations [17].

The contemporary period is characterized by high costs and rising market prices, which, despite negative economic consequences, stimulate the rational allocation of resources and orient enterprises towards profitable production. In this context, the continuous search for ways to optimize costs becomes a necessary element of the enterprises' competitive strategy [16]. Production cost

management at the current stage is defined as a process of systematic control over the deployment of expenditure resources and the active participation of management personnel, ensuring continuous monitoring and adjustment of the product's cost price. The main factors determining increased attention to cost price in management are: rationalization of limited resources, ensuring profitability through savings, supporting integrated indicators of economic efficiency, analyzing planned and actual costs to identify deviations, determining gross profit, making management decisions regarding the optimization of production processes, and expanding the product range.

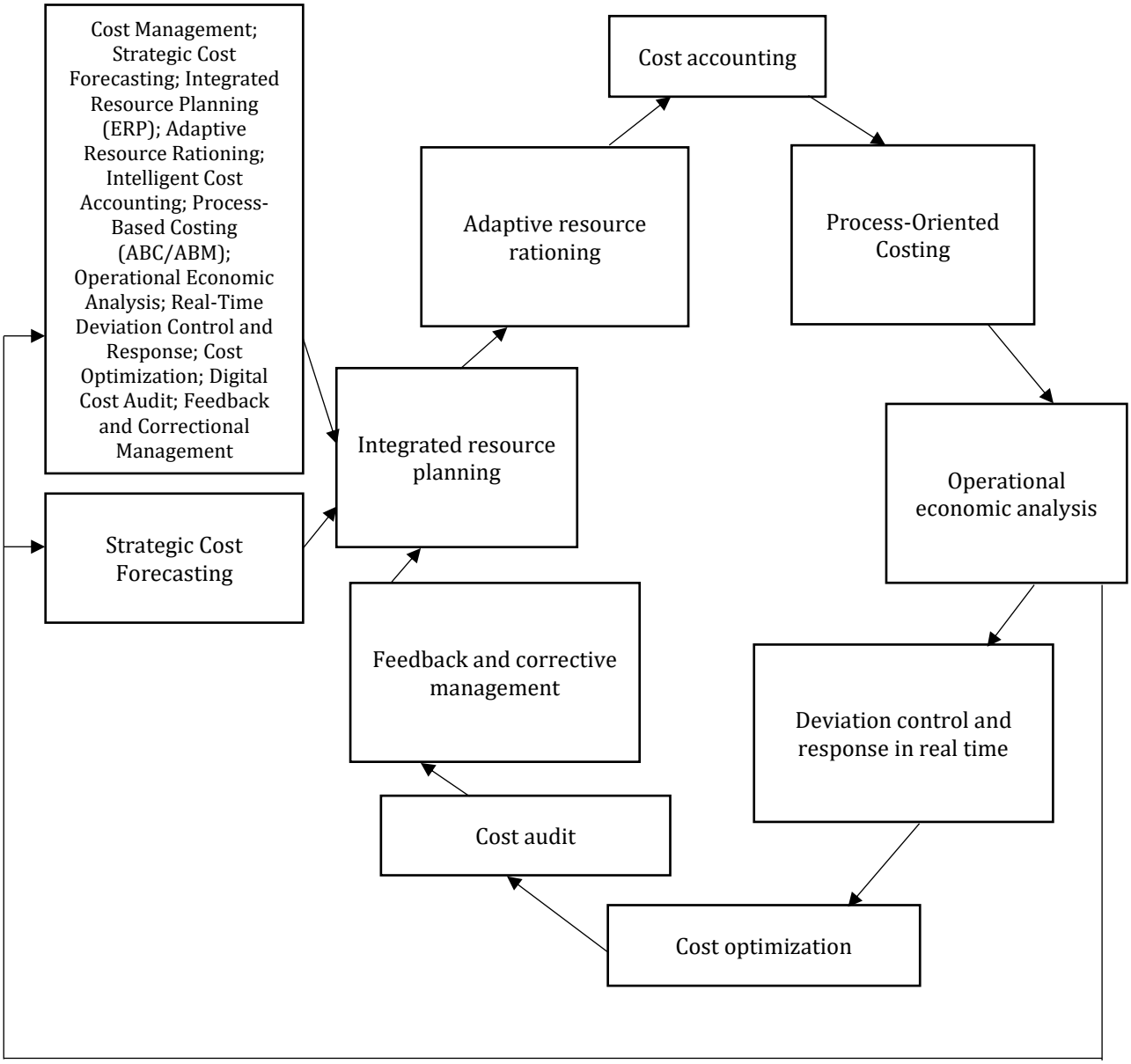

Figure 1. Main Elements of the Production Cost Control System

Source: Author's own development.

The development of a cost control system is based on three fundamental principles: deep and comprehensive analysis of the enterprise's activities, building a system based on cost assessment, and implementing mechanisms for continuous improvement of production processes. This approach ensures a high level of adaptability and functional integrity of the control system compared to other cost formation and management models [3].

It should be emphasized that cost control is not synonymous with direct cost management, and effective management can only influence the cost level by transforming production activities and changing tactical and operational goals. Therefore, the stages of cost management include setting accounting and costing standards, ensuring integration with other enterprise systems, monitoring

actual costs, comparing them with normative indicators, and analyzing deviations for operational adjustment of production processes [17].

Most modern studies emphasize that costs are not only the basis for cost price calculation but also an integrated indicator of economic rationality, technological sophistication, and financial discipline of the enterprise [18]. Given this, the scientific and methodological prerequisite for improving cost management systems is a comprehensive analysis of their structure, functional relationships, and the identification of potential dysfunctions.

According to the position of the leading Ukrainian researcher O. Krushelnytska, cost management is viewed as a multi-component process that includes a complex of organizational and managerial measures aimed at achieving maximum economic efficiency of the enterprise's operations [4, p. 98]. By her definition, the cost management system is a holistic, rationally structured model that functions based on the principles of continuity, goal integration, and the interdependence of organizational elements (Figure 2).

Analytical elements of the cost management system during the production of building materials

1. Forecasting and planning costs. At this stage, long-term and short-term trends in the structure and dynamics of costs associated with the manufacture of building materials are identified. Target guidelines of the cost policy are formed, which determine the cost limits necessary to achieve the planned financial and economic indicators – in particular, profitability, profitability, unit cost.

2. Rationing of costs. It involves the development of technically justified cost standards in physical and cost terms, tied to specific technological processes, types of products, production sites and centers of responsibility. This approach ensures the standardization of resource consumption and lays the foundation for further control of deviations.

3. Cost calculation consists in the distribution of actual costs by objects of calculation, which may include both individual products and orders or groups of products. As a result of this process, the actual cost of a unit of production (works, services) is determined, which is the foundation for financial analysis, pricing, profitability control and budget planning.

4. Cost accounting. It is carried out in accordance with the defined nomenclature of calculation items, within which the accumulation and distribution of costs by objects of calculation are reflected. Particular attention is paid to the accurate determination of the actual cost of production based on classification approaches (by economic content, calculation items, place of origin, etc.), which is critically important for construction enterprises.

5. Cost and cost analysis. It provides for a comprehensive study of the structure of actual costs in comparison with the planned indicators, standards and basic levels. In the process of analysis, the main factors of cost overruns are identified, proposals for optimizing resource provision are formed, internal reserves for reducing the cost of production are identified.

6. Control and regulation of the cost management process. At this stage, the cost policy is adjusted in accordance with the existing or projected deviations from the planned parameters. The planned tasks, mechanisms of rationing and regulations of resource consumption are specified, which ensures the flexibility and adaptability of the management system in the conditions of a changing external environment.

Figure 2. Analytical Elements of the Cost Management System During the Production of Building Materials

Source: Formulated by the author based on [11].

The main components of this system include functional and organizational aspects, which interact and complement each other, creating the foundation for effective cost control, planning, and regulation [4, p. 114]. The organizational structure of the cost management system distinguishes the following subsystems: identification of resource saving factors; planning and normalization of costs by category; accounting and detailed cost analysis; motivation for rational resource use and implementation of

measures for their optimization. Each subsystem performs specific functions aimed at increasing the overall efficiency of the enterprise's operations, and their interaction ensures a synergistic effect in enhancing competitiveness.

6. Conclusions

The conducted research successfully substantiated the theoretical and methodological foundations of cost management for the production of building materials and proved the necessity of transitioning from traditional accounting to a holistic, systemic control model. It was established that the key management problem lies in the absence of a mechanism capable of ensuring the functioning of control in both preventive and operational modes of influence on production activity, which complicates the timely correction of deviations.

The methodological essence of the proposed cost management system lies in forming a comprehensive mechanism for integrating the processes of supply, consumption, control, and regulation of resource flows. The system encompasses such critically important analytical elements as strategic cost forecasting, adaptive resource normalization, process-oriented costing (ABC), and real-time deviation control.

The key characteristics of the developed system are purposefulness, flexibility, adaptability, and manageability. Its implementation provides construction-profile enterprises with tools for the accurate determination of the actual product cost price, increased economic justification of management decisions, and a significant enhancement of resilience to external price risks. This is a guarantee for the rationalization of resource-intensive activities and competitiveness in conditions of market instability.

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