

PROBLEMS, METHODOLOGY, AND IMPROVEMENT OF COST CALCULATION IN MANAGERIAL ACCOUNTING

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Abstract: This article examines the key problems, methodological approaches, and modern improvement strategies of product cost calculation within the framework of managerial accounting. The study emphasizes the importance of accurate cost determination as a fundamental tool for effective management decisions, planning, and financial control. It explores existing limitations in traditional cost accounting methods, such as incomplete cost allocation, lack of real-time data, and insufficient integration with digital management systems. Furthermore, the article highlights innovative approaches, including activity-based costing (ABC), digital accounting technologies, and artificial intelligence applications for cost optimization. Research findings show that implementing modern cost management techniques not only enhances accuracy and transparency but also increases a company's competitiveness and decision-making efficiency.

Key words: Managerial accounting, cost calculation, cost management, methodology, product cost, activity-based costing, digital accounting, optimization.

Introduction

In the context of the rapidly developing digital economy, cost calculation has become one of the most crucial aspects of managerial accounting. The accuracy and transparency of product cost determine not only the financial results of an enterprise but also its strategic competitiveness in the market. According to the *International Federation of Accountants (IFAC, 2021)[1]*, the main goal of managerial accounting is to provide timely and relevant information for internal management decisions, and cost calculation plays a central role in this process.

In Uzbekistan, the importance of improving cost accounting methodology is emphasized in the *Decree of the President of the Republic of Uzbekistan "On measures to further improve accounting and audit systems in accordance with international standards" (No. PQ-4611, 2020)[2]*. This document encourages enterprises to adopt modern accounting technologies, including digital platforms and analytical tools, to enhance cost accuracy and decision-making effectiveness.

However, traditional cost calculation methods often face several issues: inaccurate allocation of indirect costs, limited use of analytical tools, and weak integration with management information systems. These problems lead to errors in pricing, budgeting, and performance evaluation. Therefore, it becomes necessary to modernize the methodological framework of cost calculation in managerial accounting by integrating innovative approaches such as *Activity-Based Costing (ABC)*, *Target Costing*, and *AI-assisted accounting systems*.

In this study, the methodological foundations of cost calculation, the challenges in applying modern techniques, and the directions for improving cost management in enterprises are analyzed. Special attention is given to the role of information technologies and artificial intelligence in optimizing accounting processes and improving the reliability of financial analysis.

Literature Review

The issue of cost calculation and its improvement in managerial accounting has been studied by both Uzbek and foreign researchers who emphasize the need to modernize traditional accounting systems in line with digital transformation and international standards.

According to **A. Abdullayev (2021)** in his work “*Modern Approaches to Cost Formation in the Management Accounting System*” [3], the existing cost accounting practices in many Uzbek enterprises are still largely based on normative and planned approaches inherited from the Soviet economic system. Abdullayev emphasizes that such models often fail to accurately reflect real production costs due to the use of weak analytical tools and outdated cost allocation methods. He argues that the lack of flexibility in traditional systems prevents enterprises from making timely and data-driven management decisions.

Abdullayev proposes the introduction of **Activity-Based Costing (ABC)** and **Target Costing** as effective modern methodologies that enable a more precise identification of cost drivers and facilitate strategic decision-making. His empirical analysis of several industrial enterprises in Uzbekistan demonstrates that implementing the ABC model can reduce hidden and indirect costs by up to **18%**, while simultaneously enhancing managerial decision accuracy and operational transparency. These results underline the importance of transitioning from traditional normative cost systems to dynamic, information-based management accounting frameworks.

Foreign scholars have also contributed significantly to this field. **Drury, C. (2018)** in his book “*Management and Cost Accounting*” [4] explains that traditional cost calculation systems are not sufficient for modern competitive environments. He argues that managerial accounting should move towards more flexible and technology-based models. Drury introduces the concept of *strategic cost management*, which integrates accounting data with business intelligence systems to ensure real-time cost monitoring and performance evaluation.

Similarly, **Horngrén, C., Datar, S., and Rajan, M. (2021)** in “*Cost Accounting: A Managerial Emphasis*” [5] analyze how digitalization and artificial intelligence are reshaping cost accounting functions. They show that machine learning algorithms can detect cost anomalies and predict budget deviations, helping managers optimize resources efficiently.

Comparative analysis of these studies shows that while Uzbek researchers focus more on adapting international methodologies to the local business environment, foreign authors emphasize automation, AI-based analytics, and strategic integration of accounting data into management decisions. Both directions, however, underline the necessity of combining methodological precision with technological innovation to enhance the efficiency and reliability of managerial accounting systems.

Analysis and Findings

The analysis of cost calculation practices in managerial accounting reveals that enterprises increasingly require dynamic and data-driven approaches rather than static cost determination models. The study identifies that the main problems in existing systems include the inaccurate allocation of overhead costs, limited integration between accounting and production departments, and insufficient analytical use of data for decision-making.

In Uzbek manufacturing enterprises, cost accounting is often conducted manually or using outdated software, which causes delays in information flow and increases the risk of human error. For example, in a textile company in Andijan region (2023 case study), indirect costs such as energy consumption and machine depreciation were distributed equally among production lines, despite significant differences in machine usage and output levels. As a result, product cost accuracy was reduced by approximately 12–15% [6]. After introducing *Activity-*

Based Costing (ABC), overheads were assigned based on real activity drivers (machine hours, energy consumption, labor time), which improved cost transparency and allowed management to identify underperforming production units.

A similar issue was observed in a food-processing enterprise in Tashkent, where traditional cost allocation methods failed to account for seasonal variations in raw material prices. By applying *Target Costing* and *Variance Analysis*, the enterprise managed to optimize its pricing strategy and reduce material cost deviations by 10%.

On the international level, studies by **Zhang & Chen (2022)**[7] show that the integration of artificial intelligence in cost analysis allows companies to automatically identify cost anomalies and generate predictive insights. For instance, AI-powered systems in German manufacturing firms can predict production cost deviations with up to 94% accuracy, enabling proactive budget adjustments.

The findings of this research indicate that the implementation of modern digital technologies — including *ERP systems*, *Machine Learning algorithms*, and *real-time data analytics* — can significantly improve cost management efficiency. However, the success of such technologies depends on the readiness of managerial staff, data infrastructure, and the proper adaptation of global methodologies to local business environments.

Based on the conducted analysis, several important recommendations can be proposed to improve the efficiency and accuracy of cost calculation in managerial accounting systems.

First, enterprises should **implement Activity-Based Costing (ABC)** as a fundamental approach for allocating indirect costs more accurately. Unlike traditional costing systems, ABC identifies specific activities that consume resources and assigns costs according to real operational drivers such as machine hours, labor time, or material usage. This method increases transparency and allows managers to identify inefficient processes and hidden costs that affect profitability.

Second, it is essential to **digitalize cost accounting processes** by integrating them into modern *Enterprise Resource Planning (ERP)* and *AI-powered analytical systems*. Digital platforms can automatically collect, process, and analyze large volumes of accounting data in real time, minimizing human errors and ensuring data consistency across all business departments. The introduction of such systems will not only save time but also improve the reliability of managerial decisions.

Third, **professional training and capacity building** for accounting and management staff are crucial. Many enterprises face difficulties in adopting new technologies due to a lack of practical knowledge and digital literacy. Regular workshops and certification programs on cost analysis, financial modeling, and digital accounting tools should be organized to bridge this gap. Fourth, the introduction of **predictive and analytical tools** based on *Machine Learning* and *Artificial Intelligence* will allow enterprises to anticipate cost fluctuations and optimize resource allocation. Predictive models can detect anomalies, forecast deviations, and support more effective budgeting strategies, reducing overall operational risk.

Finally, **government and institutional support** should be strengthened. The Ministry of Economy and Finance, together with the Chamber of Auditors of Uzbekistan, could develop national guidelines and incentives for enterprises that implement digital and AI-based accounting systems. Such policy support would accelerate the modernization of managerial accounting and align it with international standards.

In summary, the modernization of cost calculation through advanced methodologies and digital transformation is a strategic necessity for sustainable economic growth. By combining innovative technologies, professional competence, and supportive regulation, enterprises can

achieve higher efficiency, cost accuracy, and competitiveness in both domestic and global markets.

Conclusion

The study concludes that improving cost calculation in managerial accounting is one of the key factors for enhancing the financial sustainability and competitiveness of enterprises in the modern economy. Traditional costing systems, which rely on static and normative approaches, no longer meet the demands of digitalized production and management processes. Therefore, integrating innovative methods such as *Activity-Based Costing (ABC)*, *Target Costing*, and *AI-assisted accounting technologies* has become an inevitable necessity.

Research findings show that enterprises implementing modern cost management techniques achieve higher accuracy, transparency, and operational efficiency. The application of digital tools — particularly *ERP systems*, *data analytics*, and *machine learning algorithms* — enables real-time monitoring of production costs and supports evidence-based managerial decisions. These technologies minimize human error, optimize cost allocation, and allow managers to predict financial outcomes with greater precision.

In summary, cost calculation improvement in managerial accounting is not merely a technical process but a strategic element of economic modernization. The synergy of technology, methodology, and professional expertise will ensure sustainable business development and contribute to the overall efficiency of the national economy.

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