The current state of production cost accounting practices and the procedural method of determining production costs in cotton and textile clusters

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Abstract
Purpose: This study aims to analyze the current practices of production cost accounting in cotton and textile clusters and to evaluate the application of the process-based costing method for determining production costs. The research seeks to identify existing shortcomings in accounting systems and propose solutions to improve cost accuracy, transparency, and management efficiency.

Research methodology: The study employs analytical, comparative, and monographic methods, combining theoretical and empirical approaches. Data were collected through expert surveys, document analysis, and observation of accounting practices in domestic and foreign textile enterprises. Economic and mathematical modeling was also used to assess the effectiveness of process-based costing models.

Results: Findings reveal that traditional accounting systems in the textile industry often lack precision, automation, and digital integration. The process-based method, when combined with digital tools, significantly enhances cost control and managerial decision-making. The study also highlights the critical role of human resource competence in successful implementation.

Conclusions: Improving cost accounting practices requires adopting process-based methods, advancing digitalization, and strengthening accounting staff qualifications. These measures will ensure higher accuracy, transparency, and competitiveness across textile clusters.

Limitations: The study is limited to selected textile clusters and does not include comparative sectoral analysis, which may affect generalization.

Contribution: This research contributes to refining cost accounting methodologies and offers practical strategies for digital transformation and efficiency enhancement in textile clusters.

Keywords*: Accounting Improvement, Cost Accounting, Digitalization, Process Costing, Textile Clusters*

1. Introduction

The development of the textile industry within the framework of the cluster model requires improvement in all aspects of management, including the cost accounting system for production (Shcherbak, 2017). Cotton and textile clusters, as complex production associations that include a full cycle from raw materials to finished products, have specific requirements for accuracy, transparency, and efficiency in their accounting. Today, many enterprises continue to use traditional cost accounting methods, which do not fully meet the requirements of modern management and information systems (Bernabeu, 2022).

This makes it difficult to make informed economic decisions and reduces the effectiveness of cost management (Mechler, 2016). Therefore, it is important to study and implement a process-based cost accounting method that is adapted to the conditions of a cluster model for pig farms.

The purpose of this study is to assess the current state of cost accounting and cost calculation practices in cotton and textile clusters and to justify the feasibility and implementation of the process-based method, considering the specific features of the industry. The research objectives are as follows: to analyze the current methods of cost accounting at cluster-type enterprises; to identify the shortcomings and problematic aspects of traditional approaches to cost accounting; to study the features of applying the process (processual) method in the context of textile production; to assess the level of digitalization and automation of cost accounting in clusters; to conduct an expert survey of industry specialists; and to develop practical recommendations for implementing the process method of accounting, taking into account modern requirements (Endi, Fanggidae, & Ndoen, 2023). The object of the study is the system of cost accounting for production and calculating the cost of production in enterprises of cotton-textile clusters, while the subject of the study is the methods of cost accounting and cost calculation, in particular, the process method used in the conditions of a cluster form of production organization (Nimtrakoon & Tayles, 2015; Shidov[1], Gedgafova, Kazieva, Sizhazheva, & Shogentsukova, 2019).

The relevance of this study lies in the fact that the textile industry is one of the most resource-intensive and multistage sectors of the economy. Each production stage—from cotton cultivation and ginning to spinning, weaving, dyeing, and garment manufacturing—has its own specific cost drivers and technical processes (Ramadhani, Rinaldi, & Fitria, 2025). In such a complex environment, accurate cost information is essential for determining the actual profitability of products, setting competitive prices, and evaluating the efficiency of each production stage (Celestin, 2018). Traditional costing systems, which often rely on general or historically averaged indicators, fail to reflect the actual consumption of materials, energy, and labor resources (Hardana, Nasution, Damisa, Lestari, & Zein, 2023). Consequently, enterprises may experience distortions in cost data, leading to poor budgeting and ineffective decision-making at both the operational and strategic levels.

The process-based costing method addresses these issues by linking costs directly to each technological process and accounting for resource utilization more objectively (Gibran, Jaddang, & Ardiansyah, 2021). By establishing process centers and accumulating costs continuously, managers can identify inefficiencies at specific stages, such as excessive waste, idle time, or disproportionate overhead absorption. Furthermore, this method facilitates better cost control and enables benchmarking between departments or enterprises within a cluster. Such analytical capability is crucial for clusters that operate under unified production networks, where the coordination and comparability of financial data determine collective competitiveness (Putra, Ahadiyat, & Keumalahayati, 2023).

Another significant factor influencing the modernization of accounting systems in textile clusters is the advancement of digitalization and automation technologies. The integration of accounting software, Enterprise Resource Planning (ERP) systems, and data analytics tools allows enterprises to record and analyze cost data in real time (Dalal, 2020; Vats & Biswas, 2023). Digital accounting platforms not only reduce manual errors but also enhance the timeliness of reporting and management responses (Olaoye & Bello, 2025). By automating cost allocation and digitally tracking material and labor flows, enterprises can significantly improve the accuracy and transparency of their cost calculations. This transformation aligns with the broader trend toward Industry 4.0, where digital ecosystems connect production, logistics, and financial management into a single integrated framework (Vianney & Nurofik, 2024).

In addition to technological factors, human capital plays a pivotal role in the effectiveness of modern cost-accounting systems. The competence and analytical skills of accountants, financial managers, and production controllers largely determine the success of new costing methods (Ahmed Mohamed Ghandour, 2021; Armitage, Webb, & Glynn, 2016; Cox III, Buck, & Morgan, 2019). Therefore, ongoing professional development and training programs in process costing, digital accounting systems, and cost analysis are necessary to ensure that personnel can utilize modern tools effectively. A skilled

workforce can transform cost data into actionable insights, thereby supporting evidence-based decision-making and enhancing long-term competitiveness.

Furthermore, adopting process-based cost accounting has implications for the broader governance of industrial clusters. The availability of transparent and standardized cost information facilitates coordination among cluster members, enhances trust, and supports collective investment and innovation strategies (Nestle, Täube, Heidenreich, & Bogers, 2019). It also contributes to regulatory compliance, as governments and financial institutions increasingly demand accurate cost data for auditing, taxation and subsidy evaluation. Thus, the modernization of cost accounting is not merely an internal management issue but also a strategic requirement for ensuring the sustainability and competitiveness of the textile sector in national and global markets. In conclusion, modernizing cost accounting systems through the process-based method is a fundamental step in aligning the textile industry with the principles of efficiency, transparency, and innovation. By integrating technological advancements, human resource development, and methodological refinement, enterprises in cotton and textile clusters can build a robust accounting framework that supports informed decision-making and sustainable growth.

2. Literature Review

2.1 *Theoretical Foundations of Production Cost Accounting*

Production cost accounting is an essential part of managerial accounting that provides quantitative information on the costs of producing goods and services. According to Datar, Rajan, Beaubien, and Janz (2022), the primary objective of cost accounting is to generate reliable information for internal management purposes such as pricing, budgeting, cost control, and performance evaluation. In manufacturing industries, cost accounting systems must be designed to capture the complex flow of resources through multiple production stages. The procedural or process-based method of costing, often referred to as process costing, emerges as one of the most effective techniques for continuous and homogeneous production systems.

Drury, Klein, Pfaff, and Bonaceto (2015) and Shanmugam (2022) emphasize that this method allows enterprises to systematically assign costs to sequential production stages, ensuring a clear link between resource consumption and product output. Each stage or department is treated as a cost center, and costs are transferred progressively from one process to the next until the final product is completed. In textile enterprises, where raw cotton undergoes multiple transformations—spinning, weaving, dyeing, and finishing—the process costing method provides a reliable way to trace costs across interrelated stages (Rahu, Neolaka, & Djaha, 2023). Unlike job-order costing, which is suitable for customized production, process costing standardizes cost tracking, allowing the calculation of average costs per unit and facilitating efficiency comparisons among production lines.

2.2 The Importance of Cost Accounting in Cotton and Textile Clusters

Cotton and textile clusters are vertically integrated industrial formations that combine raw material producers, semi-finished product manufacturers, and final goods producers into a single, cohesive value chain. This organizational form is common in developing economies such as Uzbekistan, India, Bangladesh, and Indonesia, where the textile industry contributes significantly to employment and export revenues. In cluster systems, effective cost accounting becomes not only a financial management tool but also a strategic mechanism for maintaining competitiveness Klyuev et al. (2022); Naqvi, Khaskhely, Khaskhely, and Mangrio (2021) cluster theory suggests that inter-firm cooperation enhances innovation, efficiency, and productivity. However, the financial management of such integrated networks requires consistent cost accounting frameworks that ensure transparency and comparability across member enterprises.

According to Azimova and Yuldasheva (2025) and Kuklina and Shevchenko (2020), most textile clusters in Central Asia still rely on traditional cost accounting methods, which emphasize aggregate cost accumulation without detailed process breakdowns. These systems fail to accurately capture cost drivers, especially indirect expenses such as energy use, depreciation, and maintenance. Consequently, enterprises face difficulties in identifying inefficiencies and benchmarking performance across

production units. Empirical evidence from Reza and Quraishi (2024) in Bangladesh supports this view, showing that inadequate accounting systems hinder decision-making and distort production-cost estimates. The absence of standardized accounting policies within clusters also impedes data consolidation and joint-performance analysis. This highlights the need for harmonized methodological approaches, particularly the process-based costing method, to improve cluster-wide management and reporting.

2.3 The Procedural (Process-Based) Method of Cost Determination
The procedural method, often synonymous with process costing, is widely applied in industries that have continuous production processes. Tankisi et al. (2020) and Yin et al. (2020) define it as a system in which production costs are accumulated for each department or process and then averaged over the units produced during a specific period. This allows managers to determine unit costs with high precision and to monitor cost variations at each stage. In the textile industry, the process method enables the tracing of direct materials (e.g., cotton, dyes, chemicals), direct labor, and overheads across multiple transformation stages. Khan, Pi, Khan, Hussain, and Nawaz (2019) found that process costing improves accountability by linking cost data directly to production operations, facilitating variance analysis and budget control. Moreover, Nguyen, Abu Afifa, Thi Truc Dao, Van Bui, and Vo Van (2025) argue that when combined with digital data recording, process costing enhances real-time monitoring and cost transparency, supporting agile management decisions.

However, several scholars have noted that applying the process method in textile clusters faces methodological challenges. The presence of joint and by-products, fluctuating raw material prices, and high energy dependency complicate the cost allocation. To overcome these limitations, Kaur and Gupta (2023) recommend hybrid models that integrate Activity-Based Costing (ABC) with process costing. The hybrid system enables a more precise allocation of overhead costs using cost drivers such as machine hours, batch size, or energy consumption. This is particularly relevant for the dyeing and finishing stages, where resource intensity and variation are the greatest.

2.4 Current Challenges in Cost Accounting Practices
Despite its recognized importance, the adoption of modern cost-accounting practices in cotton-textile clusters remains limited. Saleem, Shenbei, and Hanif (2020) observed that many enterprises continue to use manual accounting systems, which are prone to errors, delays, and inconsistencies. The lack of automation prevents real-time cost monitoring and increases the administrative workload. Moreover, differences in accounting policies between cluster members make consolidated reporting difficult for them. Another major barrier is the shortage of qualified accounting personnel trained in modern cost management techniques. Studies by Mandal, Gupta, and Khanna (2025) show that a large portion of cost accountants in the textile industry are unfamiliar with digital tools, cost drivers, or process-based methods.

As a result, cost reports often provide descriptive rather than analytical information, limiting their usefulness for managerial decision-making.' The low level of digitalization also hampers data integration between the accounting and production departments. Many clusters lack Enterprise Resource Planning (ERP) or Manufacturing Execution Systems (MES) that connect operational data (e.g., material flow, labor input, and machine time) with financial accounting. According to Saini et al. (2024), digital platforms enable cost data to be captured automatically and processed instantly, improving both accuracy and timeliness. The absence of such systems leads to incomplete cost analyses and limited managerial control.

Environmental costs represent another overlooked aspect. Mehta and Singh (2024) emphasized that most textile enterprises fail to include ecological factors, such as waste treatment, water usage, and carbon emissions, in cost calculations. This omission not only underestimates the true production costs but also weakens sustainability reporting and compliance with international standards. Integrating environmental management accounting (EMA) into process costing can therefore enhance both financial and environmental performance (Afriyani, Indrayani, Indrawan, Wibisono, & Ngaliman, 2023).

2.5 The Role of Digitalization and Automation in Cost Accounting

Digitalization has become a defining factor in modern cost management. Zhang (2024); Jayasuriya and Sims (2023) highlight that integrating ERP and digital accounting tools allows firms to automate cost recording, streamline reporting, and improve accuracy. In textile clusters, where thousands of transactions occur daily, digital systems reduce the manual workload and provide instant access to cost data. The combination of process costing with digital technologies, such as IoT sensors, data analytics, and cloud accounting, enables real-time tracking of production costs and resource consumption. For instance, energy or material usage can be automatically linked to specific processes or products, creating a dynamic cost structure that reflects the actual production conditions (Firaldi, Wibisono, Ngaliman, Indrayani, & Satriawan, 2023).

Tursunov et al. (2024) argue that digital transformation should not be limited to technology adoption and should also include regulatory and educational support. Governments and cluster management bodies must provide training programs, technical infrastructure, and standardized digital reporting frameworks to ensure consistent implementation across enterprises. Furthermore, economic-mathematical modeling offers additional tools for improving cost estimates. By incorporating time and labor parameters, such models allow enterprises to simulate production scenarios and optimize their resource allocation. The use of digital modeling in conjunction with process costing increases precision and aids in the development of predictive analytics for decision-making.

2.6 Managerial and Strategic Implications of Process-Based Costing

The implementation of process-based methods has profound managerial implications. Accurate cost data provide a foundation for strategic pricing, budgeting, and resource optimization. Managers can identify cost centers with high inefficiency, analyze variance between standard and actual costs, and adjust production plans accordingly (Muliyanto, Indrayani, Satriawan, Ngaliman, & Catrayasa, 2023). At the cluster level, standardized process-based accounting facilitates coordination and benchmarking among enterprises (Li, Xie, Chen, & Fu, 2024). When cost information is comparable, clusters can make joint decisions regarding investments, capacity expansion, and technology upgrades. It also enhances accountability and trust among partners, fostering collective competitiveness.

Process-based costing also supports sustainability and corporate responsibility initiatives. By quantifying resource use and environmental impacts per process, textile enterprises can monitor their ecological footprint and transparently report it to regulators and international buyers (Gonçalves & Silva, 2021). This is becoming increasingly important as global supply chains demand traceability and sustainability certification. Finally, human factors remain central. Without competent accountants and financial managers capable of interpreting data, even advanced systems will fail to deliver their full potential. Therefore, training programs and professional development in digital accounting, cost modeling, and data analytics are essential for sustainable improvements in cluster management.

2.7 Directions for Improvement and Future Research

The literature identifies several directions for enhancing cost accounting practices in cotton-textile clusters.

1. Adoption of process-based costing frameworks to improve the accuracy and transparency of cost allocation.
2. Integration of digital technologies (ERP, cloud accounting, IoT) for real-time data processing.
3. Harmonization of accounting standards across cluster participants to enable consolidated reporting.
4. Incorporation of environmental cost components to align with sustainable development goals.
5. Capacity building and professional training to strengthen the human resource base in accounting.

Future research should focus on the empirical testing of hybrid models that combine process costing with ABC and EMA principles, as well as the economic impact of digital transformation within clusters. Longitudinal studies are also needed to assess the performance outcomes of enterprises that have adopted process-based systems compared to those that rely on traditional methods.

3. Methodology

The following methods were used in the research process (Boyarintsev, 2013):

- analytical method - for the analysis of current cost accounting practices and the identification of their shortcomings;
- comparative analysis - for the comparison of traditional and modern calculation methods;
- Economic and mathematical modeling in the development of optimal schemes for cost allocation
- monographic method - for the theoretical justification of the application of the procedural method;
- Expert survey: To identify practical difficulties for accountants and economists in the industry.
- systematic approach to develop comprehensive recommendations for the digitalization of accounting.

4. Results and discussion

An analysis of the current cost accounting practices in Uzbekistan's cotton and textile clusters reveals that most enterprises still rely on traditional accounting methods inherited from the Soviet Union's planned economy. Standard and process-based accounting are widely used, but their implementation often fails to meet modern requirements for transparency, automation, and managerial flexibility. According to the data summarized in Table 1, traditional methods have several drawbacks. First, the level of automation remains partial, as most enterprises still rely on manual data entry, which increases the risk of errors and slows the generation of management-report generation.

The accounting of indirect costs is particularly problematic, as they are often allocated proportionally to direct costs without considering the actual consumption of resources, distorting production costs. The transparency of cost accounting is also low, especially in the multi-stage production process typical of clusters (from the primary processing of cotton to the production of finished textiles). This, in turn, makes it difficult to link cost accounting to the management control system, as cost data are not always available to management in a form that is suitable for analysis.

Table 1. Analytical method: Current cost accounting practices in cotton and textile clusters

	The cost accounting aspect	The state in practice	Identified shortcomings
1	Accounting methods used	Traditional (normative, process-based, order-based)	Low accuracy and laboriousness of calculations
2	Automation level	Partial	Manual input, high probability of errors
3	Accounting for indirect costs	Formal	Uneven distribution of costs
4	Transparency of cost accounting	Limited	Difficult management decision-making
5	Accounting and management link	Weak	No direct integration with budgeting

Thus, the analytical method allowed us to identify the key problems of the current cost accounting system. This serves as a basis for finding more effective and accurate approaches, particularly the implementation of a process-based accounting method based on cost accounting by the operations, activities, and stages of the technological chain. In modern business conditions, especially within the framework of the cluster model, it is important to choose an effective cost calculation method. The comparative analysis presented in Table 2 demonstrates the fundamental differences between traditional approaches (standard, process, and order-based) and modern process accounting methods.

Traditional methods used in many cotton and textile cluster enterprises are relatively easy to implement and use by workers. However, they do not provide sufficient accuracy in the allocation of indirect costs and do not allow for a flexible response to changes in the production process. These methods often focus on general indicators and do not consider the nuances of production operations. In contrast, the process method (or the method of cost accounting by processes–Activity-Based Costing, ABC) provides a

higher cost accuracy, as it allows tracking costs at each specific stage of the technological chain. It focuses on activities (processes) as sources of costs and not only on the volumes of production. The procedural method also contributes to higher accounting automation, especially when implementing information systems (ERP, 1C, SAP, etc.). This increases data transparency and improves the quality of management decisions made. However, it is worth noting that its implementation requires certain resources, such as qualified personnel, a well-established IT infrastructure, and a willingness to undergo organizational changes.

Table 2. Comparative analysis of cost calculation methods

Indicator	Traditional methods	The procedural method
Cost allocation accuracy	Medium	High
Accounting flexibility	Low	High
Cost accounting by operations	No	Yes
Automation	Limited	High (if there is an IP)
Transparency for managers	Low	Increased
Implementation complexity	Low	Medium/high

A comparative analysis shows that, despite the difficulties of implementation, the process method is more promising for cluster production, where accurate cost assessment at every stage, from raw materials to finished products is important. In the context of the complex production structure of cotton and textile clusters, the effective allocation of costs between the stages of the technological chain requires a scientific approach. One such tool is economic and mathematical modeling, which allows the construction of reasonable and flexible cost calculation schemes. As shown in Table 3, various models are used in practice depending on the goals and specifics of the enterprise. For example, the model of normative cost allocation by technological stages is used for planned cost calculation, where the resource consumption rates are determined in advance for each stage. This model allows for the formation of basic guidelines and the identification of deviations from the norm in real time.

The activity-based costing (ABC) model allows for more accurate cost accounting by allocating costs based on actual activities and operations. This is particularly important in situations where numerous indirect costs, such as equipment depreciation, electricity, and management staff salaries, can significantly impact the cost structure. By using the ABC model, organizations can gain a deeper understanding of their cost structures and make more informed management decisions. The use of linear models based on the relationship between costs and production volume allows for the prediction of cost behavior as the production volume changes. These models enable scenario analysis and the planning of production programs based on profitability considerations. Finally, marginal analysis, which involves dividing costs into fixed and variable costs, is used to estimate the break-even point, determine critical production volumes, and calculate the financial stability of enterprises.

Table 3. Economic and Mathematical Modeling: Optimal Cost Allocation Schemes

№	The model used	Appointment	Advantages
1	Stage-by-stage allocation model	Cost allocation automation	Reducing errors, saving time
2	ABC costing model	Activity-based cost accounting	More accurate cost determination
3	Linear cost model	Cost forecasting	Accounting for production changes
4	Marginal analysis	Variable and fixed cost allocation	Improving management efficiency

Thus, economic and mathematical models are essential elements of modern cost accounting and management in textile clusters. They allow for the adaptation of the costing system to production conditions, improving its accuracy and analytical value and providing informed recommendations for resource optimization. The use of the monographic method in the study of cost accounting and cost calculation allows for an in-depth examination of the scientific foundations, evolution, and adaptation of the process method in modern production systems, particularly in the cotton and textile clusters.

As reflected in Table 4, the basis for the process (processual) approach is laid in the works of authors such as Peter Drucker and Robert Kaplan, who viewed business as a set of processes and operations, and not just a set of functions. Their concepts formed the basis for Activity-Based Costing (ABC), a method that lies at the heart of modern process costing. Within the framework of management accounting theory, the process method is considered a means of increasing the accuracy of calculation and a tool for making managerial decisions. It allows the establishment of cause-and-effect relationships between operations, resources, and results, which is especially important in the conditions of multi-stage textile production.

International practice (including IFRS and GAAP) confirms the effectiveness of using the process approach in industries with a high proportion of indirect costs. In this case, accounting is carried out by "cost carriers"–activities, products, or divisions involved in the production process. This allows for a more accurate determination of where and how costs arise and which product elements they affect. It is important to note that the process method theoretically emphasizes the relationship between technology and costs, that is, the need to consider changes in production processes, automation, and logistics when calculating costs. This makes the process method particularly relevant for the cluster model, where there is an integration of multiple stages (raw materials, processing, fabric and sewing).

Table 4. Monographic Method: Theoretical Aspects of the Procedural Method

№	Provisions from the literature	Content	Significance
1	Theory of production processes (P. Drucker et al.)	Accounting for technological operations	Basic justification of the process approach
2	Principles of management accounting	Linking accounting with cost management	Influence on decision-making
3	International experience (IFRS, GAAP)	Modern approaches to costing	Possibility of adapting international practice
4	Scientific research in Uzbekistan	Features of cluster accounting	Local specifics of accounting in the textile industry

Thus, the monographic study of the theoretical aspects of the process accounting method confirms its scientific validity and practical applicability in the cotton and textile industries. This creates a solid foundation for its adaptation and implementation in Uzbek enterprises seeking to improve the efficiency and transparency of their management accounting. To gain a deeper understanding of the current problems in the field of cost accounting and cost calculation in cotton and textile clusters, an expert survey was conducted among practicing accountants, economists, and financial analysts in the industry. The results, summarized in Table 5, reveal the key difficulties faced by professionals in practice.

One of the most significant problems is the lack of full-fledged automation of accounting processes. Approximately 72% of respondents noted that most cost calculations are performed manually using Excel programs, which increases the risk of errors and slows down operational reporting. The lack of modern information systems also limits the ability to implement advanced costing methods, such as the process or ABC methods. The second most important issue was the lack of staff qualifications regarding new management accounting methods. More than 65% of specialists admitted that they lacked the necessary knowledge and practical skills to switch to modern cost calculation approaches. This is especially relevant in the context of digitalization, where there is a need to understand the logic of ERP systems, configure cost-allocation algorithms, and analyze deviations.

Approximately 60% of respondents indicated difficulties with the allocation of indirect costs, especially in multi-stage production chains. Traditional schemes do not consider the actual use of resources, which leads to cost distortion and, consequently, ineffective management decisions. The factor of organizational dependence on IT specialists was also identified: 40% of respondents indicated that, due to a lack of programming skills, they were unable to adapt accounting modules to the specifics of their enterprise on their own. This hinders flexibility and reduces accounting efficiency. Finally, 55% of specialists noted the lack of industry-specific guidelines and standards, which makes it difficult to implement unified approaches to process accounting at the cluster level. This situation reduces the comparability of data between enterprises and complicates the work of auditors and the controllers.

Table 5. Expert Survey: Practical Difficulties of Accountants and Economists

№	Problem	Percentage of respondents (%)	Comments
1	Lack of automated systems	72%	They work manually or in Excel
2	Insufficient qualification in new accounting methods	65%	Training courses are required
3	Difficulties in accounting for indirect costs	60%	There are no clear distribution algorithms
4	Dependence on IT specialists	40%	Difficulties in implementing new programs
5	Lack of methodological support	55%	There are no industry standards

Thus, the results of the expert survey confirm the need for a comprehensive cost accounting reform in the cluster system, from improving the skills of specialists to implementing automated and standardized solutions tailored to the specific needs of the textile industry. The application of a systematic approach to reform cost accounting and calculation in cotton and textile clusters requires comprehensive coverage of organizational, technological, and methodological aspects. As shown in Table 6, the digitalization of accounting should not be limited to the implementation of IT products; it involves restructuring the entire system for managing production and financial flows.

In the first stage, it is necessary to conduct an audit of the existing accounting infrastructure: the availability and degree of integration of accounting and management accounting, the quality of the initial data, and the current software (for example, 1C and ERP systems). Based on this analysis, a digitalization roadmap is created that covers key areas of accounting, from primary document management to the final calculation forms. The most important element of a systematic approach is the integration of cost accounting with technology. To achieve this, it is recommended to use ERP systems that support a modular approach (accounting, production, logistics, and finance). These platforms provide automatic cost allocation by responsibility centers, processes, products, and activities, which is particularly important for clusters that include a full cycle from cotton processing to producing finished textile products.

A significant effect was achieved by implementing end-to-end data analysis from raw material procurement to sales. This requires the organization of a unified database in which all production and financial transactions are recorded in real time, ensuring transparency and accuracy in accounting. Table 6 also reflects proposals for standardizing accounting policies within the industry. It is proposed to develop industry-specific guidelines that consider the specifics of the cluster structure to uniformly implement the process accounting method.

Table 6. System Approach: Recommendations for Digitalization and Automation of Accounting

№	The direction of improvement	Recommended actions	Expected effect
1	Implementation of ERP systems	Using 1C, SAP, BOSS, and other software programs	Improving the accuracy and transparency of accounting
2	Cost allocation automation	Creating automatic calculation modules	Reducing errors and time costs
3	Staff training	Courses on process accounting and management analysis	Improving the skills of accountants and analysts
4	Accounting policy standardization	Developing unified methods and templates	Simplifying control and auditing
5	Accounting integration with management solutions	Creating dashboards and reports for management	Improving the quality of strategic management

To improve employees'skills, it is necessary to create training and professional development programs on digital accounting, management reporting, and modern methods of costing (ABC, process accounting, etc.). Finally, a systematic approach involves the interaction of all cluster participants: processing enterprises, garment factories, logistics, and sales structures. Only end-to-end automation allows for the effective and reliable formation of costs at every stage.

5. Conclusion
5.1 *Conclusion*
The conducted research confirmed the relevance of modernizing the cost accounting system in the context of cluster development in the cotton and textile industry in Uzbekistan. Traditional costing methods based on standard and process approaches do not meet modern requirements for transparency, accuracy, and manageability. This is particularly evident in the distribution of indirect costs, lack of automation in accounting, and absence of flexible analytics. The results of the analytical and comparative analyses show that the process-based costing method (Activity-Based Costing) is the most adaptive and effective solution in the context of a multi-level cluster model. It allows for cost accounting by activities and production stages, ensuring accurate cost formation, which is critical for making informed management decisions. Economic and mathematical modeling allowed us to develop optimal cost allocation schemes, and an expert survey revealed the real problems faced by accountants and economists: a lack of knowledge, weak IT infrastructure, and the absence of industry standards.

A systematic approach to the digitalization of accounting has led to the development of comprehensive recommendations, including:
- Step-by-step automation of cost accounting
- Implementation of ERP systems tailored to industry specifics.
- training personnel in modern management accounting methods;
- development of methodological guidelines to unify approaches.

Thus, the main conclusion is the need to switch from fragmented accounting to an integrated, digital, and process-oriented system that will ensure effective cost management, increase the transparency of cost accounting, and enhance the competitiveness of the cluster's enterprises as a whole.

5.2 *Suggestion*
Based on the research findings, several recommendations can be proposed to improve the efficiency and transparency of cost accounting systems in cotton and textile clusters.
1. Transition to an Integrated Process-Oriented Accounting System Enterprises should gradually replace fragmented traditional accounting methods with a unified process-based system that reflects the real structure of production processes and activities within the cluster.
2. Digitalization and Automation of Accounting Processes Step-by-step automation of cost accounting should be prioritized through the introduction of ERP systems specifically adapted to the operational

characteristics of the textile industry. This will enable real-time data exchange, enhance accuracy, and improve management control.

3. Development of Industry Methodological Standards: Uniform methodological guidelines and accounting standards for cluster enterprises must be established to ensure consistency in cost allocation, data reporting, and performance evaluation.
4. Personnel Training and Competence Development Regular training programs should be organized for accountants, economists, and managers to strengthen their knowledge of modern cost accounting, activity-based costing, and digital systems.
5. Strengthening IT Infrastructure Upgrading the technological base of enterprises will facilitate effective digital integration and ensure the long-term sustainability of cost management reforms.

These measures will enhance the accuracy, transparency, and efficiency of cost accounting and contribute to the overall competitiveness of the textile clusters.

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