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## РОЗРОБКА МЕТОДИКИ ПЛАНУВАННЯ ВАРТОСТІ ПРОМИСЛОВОЇ ПРОДУКЦІЇ ТА ШЛЯХІВ ЇЇ ЗНИЖЕННЯ

**Анотація.** У статті розглядається розвиток методів планування собівартості промислової продукції та шляхи її зниження в контексті підвищення конкурентоспроможності підприємств. Основну увагу приділено систематизації та вдосконаленню існуючих методів, а також розробці нових моделей та підходів, які дозволяють мінімізувати витрати без шкоди для якості продукції. Дослідження включає аналіз різних підходів до обліку та контролю витрат, оцінює їх ефективність та сферу застосування. Стаття підкреслює значимість технологічних інновацій та автоматизації в оптимізації виробничих процесів, що сприяє зниженню операційних витрат та поліпшенню виробничої ефективності.

**Ключові слова:** собівартість, фактори впливу, характеристика, методи визначення

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## DEVELOPMENT OF METHODS FOR PLANNING THE COST OF INDUSTRIAL PRODUCTION AND WAYS TO REDUCE IT

**Abstract.** In the current market economy conditions, the effectiveness of industrial enterprises largely depends on their ability to compete, which is closely linked to the cost of production. In this context, the planning of industrial goods' costs becomes a key aspect that influences pricing, profitability, and consequently, the stable financial position of the company. The relevance of developing effective cost planning methods and finding ways to reduce them is undoubted and driven by the need to increase competitiveness in domestic and international markets.

**Keywords:** cost, influencing factors, characteristics, methods of determination

**Introduction.** The subject of the research is the methods of planning the costs of industrial products, their theoretical foundations, practical application, and impact on the efficiency of the economic activities of enterprises. The study analyzes various approaches to planning, assessing, and controlling costs with the aim of identifying the most effective ways to reduce production costs.

**The object of the study** includes industrial enterprises, specifically their production processes, cost management systems, accounting and cost analysis methods. Special attention is given to the aspects of cost planning in the context of optimizing production processes and enhancing overall efficiency.

**The goal of the research** is to systematize, analyze, and improve existing methods of planning the costs of industrial products to ensure their maximum effectiveness and adapt them to current production conditions. This includes developing and testing new models and approaches that can reduce manufacturing costs without compromising the quality of the final product, as well as optimizing existing production processes for higher profitability. Primary attention is focused not only on directly reducing costs but also on increasing the flexibility of production processes, which allows quick adaptation to market changes and changes in production technologies.

**Research Tasks.** The analysis of existing cost planning methods involves collecting and systematizing information about traditional and modern cost planning approaches. Their effectiveness, application areas, and potential for integration with other production management systems are evaluated. This includes literature reviews, case studies, and existing practices across different types of enterprises. Study of the Impact of Technological Innovations on Cost Reduction Modern technologies, specifically automation, digitalization of production, and the implementation of ERP systems, have significant potential to optimize production processes and reduce costs. This task will involve researching the potential of the latest technologies and methods (for example, lean manufacturing and JIT) to optimize cost planning.

Development of Recommendations for Cost Optimization and Cost Planning Based on the analysis of existing methods and the assessment of the technological innovation

potential, proposals will be developed to improve the cost planning system at enterprises. This includes recommendations for implementing new technologies, modernizing existing methodologies, and developing a comprehensive cost management strategy that considers the specifics of the particular enterprise.

**Research Results.** The history of cost planning is closely linked to the development of industry and methods of production management. From manual accounting and simple methods of distributing general production costs to modern complex systems like ERP and lean manufacturing, the history of cost planning reflects the overall development of economic theories and management practices.

**Classification of Cost Planning Methods/**Cost planning methods can be classified by several criteria:

- Traditional methods, such as direct costing and the hourly method, focus on the distribution of direct costs and a simple allocation of indirect costs.
- Modern methods include ABC (Activity-Based Costing), target costing, and lean accounting, which allow for more detailed planning and allocation of costs, considering the actual involvement of resources in production.
- Innovative approaches, including the use of artificial intelligence and machine learning for optimizing costs and forecasting based on big data, are also emerging.

**Advantages and Disadvantages of Traditional Methods.** Traditional methods, such as direct costing, often use simple formulas for calculating direct costs for materials and labor. For instance, if the production of a batch of products requires materials costing 5000 UAH and 200 hours of work at a rate of 100 UAH/hour, the direct cost is calculated as follows:

$$\text{Direct Cost} = \text{Material Cost} + (\text{Hourly Rate} * \text{Quantity})$$

$$\text{Direct Cost} = 5000 + (100 * 200) = 25,000.00 \text{ UAH}$$

However, it is still difficult to take into account (the challenge remains to account for) indirect costs such as rent, equipment maintenance, and administrative expenses, which are not directly related to each unit of production.

**Modern Cost Planning Methods.** Activity-Based Costing (ABC) uses a more complex approach to cost allocation where each activity that contributes to production receives a

share of indirect costs according to its role in the production process. For example, if equipment maintenance costs amount to 10,000 UAH and it is determined that 40% of these costs are related to a specific product, the costs are allocated as follows:

$$\text{Cost}_{ABC} = \text{Indirect Cost Rate} * \text{Activity Level Indirect}$$

$$\text{Cost}_{ABC} = 10,000 * 0.40 = 4,000 \text{ UAH}$$

Automation not only reduces labor costs but also improves the quality and consistency of products, which can reduce the costs associated with defects and rework.

These formulas and techniques allow a deeper dive into the processes of planning and controlling costs, taking into account a wide range of factors from material costs to technological innovations.

**Ways to Reduce Manufacturing Costs.** Optimizing production processes is key to reducing the cost of production. This may include revising and improving technological processes, minimizing waste and non-productive operations. One way to optimize is the implementation of lean manufacturing, which focuses on identifying and eliminating all types of losses in production. Formula for calculating savings from waste reduction:

$$E = V_{\text{before}} - V_{\text{after}},$$

where E is savings,  $V_{\text{before}}$  is the volume of waste before optimization,  $V_{\text{after}}$  is the volume of waste after optimization.

The introduction of the latest technologies such as automated equipment, robotics, and IT-based production management systems can significantly reduce production costs by increasing productivity and reducing errors.

The formula for estimating cost reductions from automation:

$$C \text{ reduction} = (C \text{ labor before} - C \text{ labor after}) + (C \text{ before} - C \text{ after}),$$

where  $C \text{ reduction}$  — total cost reduction,  $C \text{ labor before}$  and  $C \text{ labor after}$  — labor costs before and after automation, respectively,  $C \text{ before}$  and  $C \text{ after}$  - waste disposal costs before and after the introduction of new technologies.

Investing in the development of personnel and fostering a corporate culture oriented towards continuous improvement can have a long-term impact on reducing the cost of production. This includes training, skill-upgrading courses, and the creation of motivational programs.

The formula for assessing the impact of staff training on productivity is:

$$P \text{ increase} = R \text{ after} - R \text{ before} ,$$

where *P increase* is the increase in productivity, *P before and after* is the level of productivity before and after training, respectively.

**Effective Cost Planning Implementation.** An enterprise specializing in electronics manufacturing faces the challenge of high component costs, which negatively affects the overall profit margin. The enterprise applies the Activity-Based Costing (ABC) method for a more accurate allocation of indirect costs and identifying "expensive" processes. Analysis showed that a significant portion of costs was attributed to the assembly of some complex components, which could be optimized by reviewing suppliers or implementing new assembly technologies.

Based on these data, the management initiated negotiations with new component suppliers offering more favorable terms, and invested in automated assembly equipment, which helped reduce labor costs.

From the aforementioned case, the following recommendations can be formulated for enterprises:

- Detailed Cost Analysis: Using methods like ABC helps gain a detailed understanding of the cost structure and identify key areas for cost reduction.
- Flexibility in Supplier Selection: Regularly reviewing cooperation terms with suppliers and searching for new partners can lead to significant savings.
- Technological Update: Investing in the latest equipment and technologies not only reduces costs but also improves the quality of products.

### **Conclusions.**

Assessment of the Effectiveness of Proposed Cost Planning Methods Applying a comprehensive approach to cost planning that combines traditional and innovative methods demonstrates significant advantages for manufacturing enterprises. The Activity-Based Costing (ABC) method provides a more precise calculation of costs, allowing managers to make more reasoned decisions regarding pricing and production strategy. Technological innovations such as automation and the implementation of production management systems play a crucial role in reducing costs and increasing

productivity. However, the success of these methods depends on the enterprise's readiness for changes and investments in technology and personnel training.

#### Recommendations for Implementing and Further Developing Cost Planning Methods

- **Deep Cost Analysis:** Enterprises should regularly review their cost structure using modern accounting and analysis methods like ABC.
- **Investments in Technology:** Implementing automated systems and robotic equipment should be a priority to reduce direct labor costs.
- **Culture of Continuous Improvement:** Creating an environment that encourages innovation and strives for efficiency is key to long-term success.
- **Environmental Sustainability:** Integrating environmental practices not only reduces costs but also improves the company's market image.

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*Надійшла до редакції 17.04.2024.*