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Article

Method of Assessing The Effectiveness of Resource Use of Industrial Enterprises

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Abstract: Efficient resource utilization is a crucial determinant of industrial enterprises' economic performance, particularly in resource-limited environments. The ability of enterprises to manage material, labor, and financial resources effectively influences their market competitiveness and sustainability. Despite existing methodologies, there is a need for a comprehensive, index-based assessment method that holistically evaluates resource use efficiency across multiple dimensions. This study aims to develop an index-based approach for assessing the efficiency of resource utilization in industrial enterprises, integrating material, labor, and financial resource evaluation. The study proposes a methodological framework incorporating index assessments for growth rates of resource utilization, measuring changes in productivity, cost efficiency, and financial performance. It introduces a cumulative integral indicator to quantify resource potential. Unlike traditional methods, the proposed index-based approach offers a dynamic, flexible evaluation mechanism that enables comparative analysis across different time periods and enterprises. The findings provide industrial enterprises with a strategic decision-making tool for optimizing resource use, improving efficiency, and enhancing financial sustainability. The methodology facilitates better resource allocation and management, contributing to long-term business growth and economic resilience.

Keywords: industrial enterprises, resource, material resources, labor resources, financial resources, index assessment, resource utilization efficiency

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1. Introduction

In cases where economic resources are limited, their rational use is a priority for business entities. The market activity of industrial enterprises is determined by the efficiency of using tangible and intangible resources. The presence of sufficient resources for the production of products and the ability to control them require maximum efficiency.

The main goal of analyzing the economic resources of industrial enterprises is to achieve economical production efficiency by assessing their availability, dynamics, quality and productivity. Accordingly, priority is given to research aimed at improving the methods for assessing the efficiency of resource use of industrial enterprises [1].

In an era of increasing economic constraints and resource scarcity, the efficient utilization of resources in industrial enterprises has become a critical factor for ensuring sustainable economic growth and competitive market positioning. Industrial enterprises operate within a dynamic and complex environment where the optimal management of both tangible and intangible resources plays a decisive role in determining business success. Effective resource allocation not only enhances productivity and cost-efficiency but also strengthens the resilience of enterprises against economic fluctuations and market

uncertainties. Therefore, assessing the efficiency of resource utilization is essential for strategic decision-making and long-term sustainability [2].

The efficiency of industrial enterprises is largely dependent on their ability to manage and optimize the use of material, labor, and financial resources. Material resources form the foundation of production processes, labor resources contribute to operational efficiency, and financial resources enable investment in innovation and growth. A comprehensive evaluation of resource efficiency must consider the availability, quality, and productivity of these resources while identifying potential areas for improvement. Previous research has explored various methodologies for assessing resource efficiency; however, there remains a need for a more integrated and dynamic approach that captures the interdependencies among different resource categories.

This study aims to address this gap by developing a structured framework for evaluating resource utilization efficiency in industrial enterprises. By employing an index-based assessment methodology, this research provides a systematic approach to measuring growth rates, analyzing resource allocation, and determining the overall effectiveness of industrial enterprises in resource management. The proposed methodology seeks to enhance decision-making processes by offering a robust analytical tool for optimizing resource utilization and improving enterprise performance.

Literature analysis

Assessment of the efficiency of resource use in industrial enterprises has been carried out by many foreign researchers. Including [1], [2], [3], In the works of Khaustovich [4] and others, proposals aimed at determining the resource potential of industrial enterprises and their effective use were put forward.

E.N. In the research of Strijakova, existing approaches to determining the efficiency of resource use of industrial enterprises were analyzed [5]. To evaluate the efficiency of the distribution of all types of resources, the following were taken as a set of parameters: labor, capital, information, human capital. Based on these factors , metrics are proposed to assess adaptive and synergistic performance.

N.N Azanova, the author's model for evaluating the economic potential of chemical enterprises was proposed [6]. A methodical approach and scale of resource potential have been developed, which allow to evaluate different options of resource use and determine reserves for competitive development of enterprises.

S.M.Kulish presents the stages of evaluating the efficiency of using resource potential of a business entity [7]. The relationship between the growth rate of key indicators and the level of business activity of the organization is shown. The main directions of increasing the efficiency of the use of production resources are presented and the procedure for evaluating financial resources is defined.

H Park, D Ahn, K Hosanagar, J Lee in their research put forward proposals for using artificial intelligence-based software tools to improve the efficiency of labor resources in industrial enterprises [8].

Shahbazi S studied the opportunities, barriers, and strategies for further improving the efficiency of material resource use in industrial enterprises in Sweden at the micro level and developed proposals aimed at increasing the separation of waste into high-quality recyclable raw materials to achieve resource efficiency [9].

Walker S consider it appropriate to assess resource consumption in order to develop resource efficiency strategies for industrial enterprises according to the following factors:

1) product design; 2) material production and sourcing; 3) process development, management and optimization; 4) extending the life of resources and creating a circular economy. It is also recognized that energy efficiency is a factor that should be taken into account in any case, as a key indicator [10].

2. Materials and Methods

Estimating the efficiency of resource use is a multi-stage process of analyzing the resources used by the enterprise to produce a unit of product. This process includes the

study of material, financial and labor resources used by the enterprise in production activities.

In the assessment, special attention should be paid to the rationality and reasonableness (balance) of resources, to the dynamic change of resource potential under the influence of technical and economic factors [11]. Analyzing the development opportunities of industrial enterprises shows ways to achieve strategic goals by evaluating the indicators of the results of changes in business, the extent to which they use material resources, human labor resources, and financial resources. The methodology of comprehensive assessment of resource use efficiency of industrial enterprises is presented in Figure 1.

3. Result

The OLS regression results (see Table 1) provide valuable insights into how financial reportin

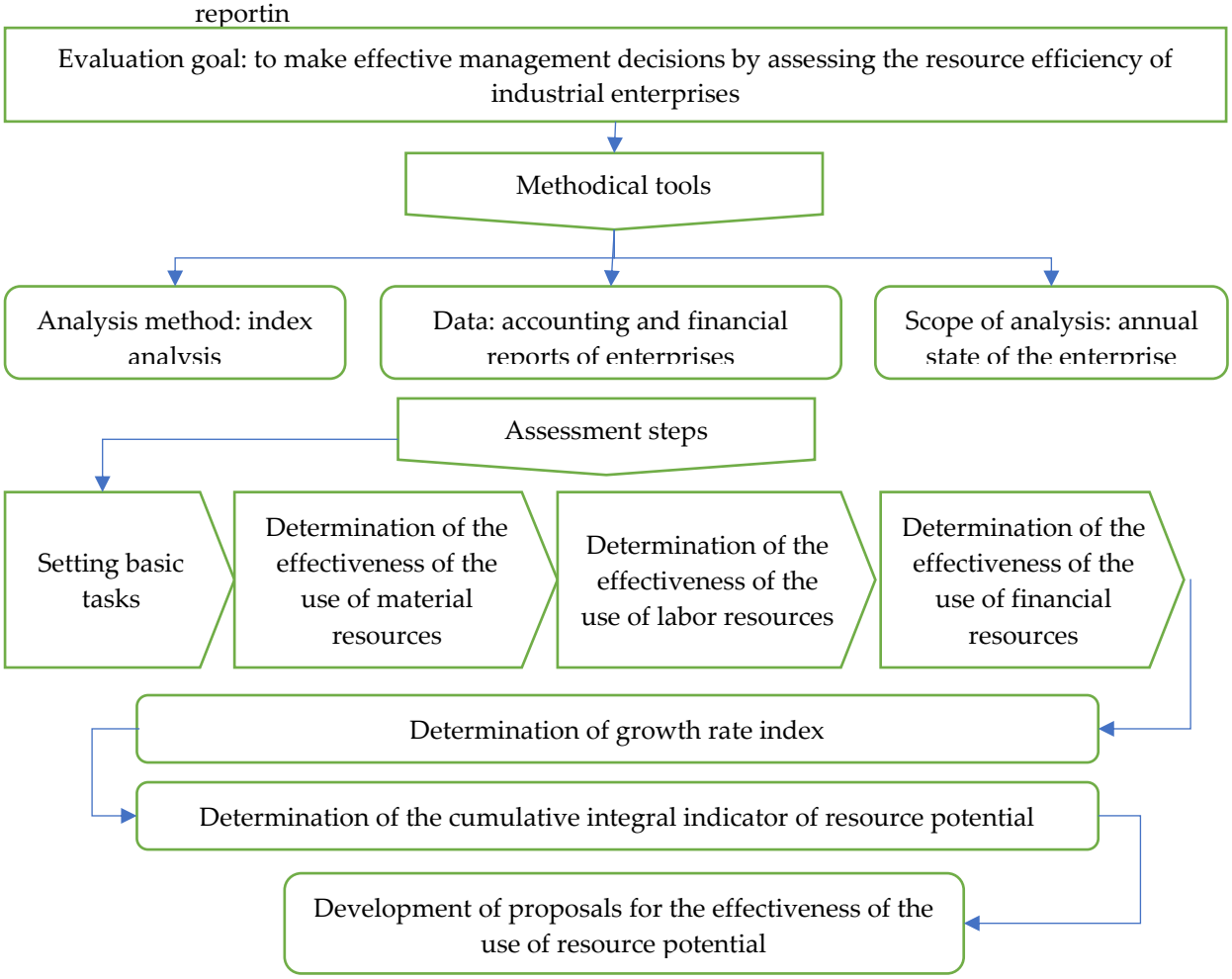

Figure 1. Index Method of Evaluating The Efficiency of Resource Use of Industrial Enterprises

It is known that an index is an indicator summarizing the gradual study of complex economic phenomena in terms of percentages. Indices summarize the changes of events in socio-economic analysis and allow evaluation based on relative quantities [12]. When determining the efficiency of resource use in industrial enterprises, it provides an opportunity to evaluate changes in efficiency in the current period compared to the previous period. Accordingly, it helps to make a strategic decision on resource management by allowing to express the extent to which the enterprise's efficiency of using resources in the current period changes compared to the previous period by evaluating it on the basis of index methods.

The most important task of assessing the resource base of an enterprise is to measure changes in order to ensure profitability, solvency and competitiveness. The main tasks of determining the efficiency of resource use of industrial enterprises include: regular

monitoring and study of the enterprise's use of certain types of resources, evaluation of activity results in certain directions; identify strengths and weaknesses in the use of resources; making rational decisions when setting specific goals of enterprise activity; to determine the possibilities of increasing the efficiency of individual areas of activity, taking into account the risks and the influence of the time factor; determine resource capabilities to achieve goals; further improvement of the tools and management methods used through the analysis of the effectiveness of the use of the resource base.

A number of methods are used to assess the resource utilization efficiency of industrial enterprises [13]. In the report on the main annual financial results of industrial enterprises, the cost of resources is kept. Material production costs - reflected in line 020 of Appendix 2 to the calculation of profit tax, are considered one of the components of the cost of products (goods, services) for sale, and include the following: raw materials and materials included in products (goods, services); materials, spare parts, inventory and household items used to ensure the normal technological process; components and semi-finished products that require assembly or additional processing; production-type works and services not related to the main type of activity performed by external legal entities and individuals, as well as internal structural divisions of the enterprise; natural raw materials (land reclamation costs, payment for trees, water , etc.); fuel used for technological purposes, production of all types of energy, heating of buildings, transport works for production services; all types of energy used for technological, transport and other production and economic needs of the enterprise; loss, deterioration and shortage of material assets in the field of production; cost of tare and packing materials

The formation of material costs for manufactured products (works, services) can be conditionally divided into the following 2 stages:

1) purchase of raw materials, materials, spare parts, accessories, inventory, fuel, energy, etc.;

2) writing them off to production.

All materials purchased at the cost of products produced during the current accounting period of the enterprise may not be written off. Some of them remain in the warehouse and can be used in the production of products in later periods. That is, the cost of materials purchased and written off to production are different indicators, and their value may be different [14].

Since the material costs consist of the company's expenses on the main material resources, the growth rate index can be used to evaluate resource efficiency. It is recommended to use the following formula when determining the index of the growth rate of material costs:

$$I_{ich/mx(t)} = K_{ich(t)}/K_{mx(t)} \quad (1)$$

In this case:

$I_{ich/mx(t)}$- the index of pictures of growth of material costs ;

$K_{ich(t)}$ – the growth rate of production volume in year t;

$K_{mx(t)}$ – The growth rate of material costs in year t

The next key resource efficiency indicator is the evaluation of the use of human resources. Evaluation of the effectiveness of the use of labor resources focuses on the study of the following issues: analysis of the number of employees, its composition and level of qualification, study of opportunities for improvement of professional skills, verification of information on the efficiency of use of working time; to study the dynamics, forms and reasons of the labor movement, as well as to analyze the implementation of the established labor discipline;

Study the impact of the number of employees on production indicators, as well as determine and compare the relationship between profitability and labor costs [15].

The main task of studying labor utilization is to identify factors that hinder the increase in labor productivity, eliminate working time losses, and lead to wage reductions. The assessment should be carried out in the following important areas: the level of provision of the enterprise with the necessary personnel; dynamics and directions of labor force movement; labor productivity indicators.

To conduct the analysis, information sources are based on statistical, operational and other reporting documents of the enterprise, which contain various information about employees.

The organization's employees are evaluated according to quantitative indicators, for which the list of employees, the average number of staff units and the number of staff units are calculated. Along with quantitative indicators, it is recommended to study qualitative indicators characterizing the professional, qualification, educational and gender composition of employees.

Studying the composition of employees allows you to analyze the efficiency of using labor resources. The indicators selected as a result of the analysis are also compared with the level of labor productivity in a particular department.

Labor productivity is studied in the following main areas: the level of performance of the assigned tasks by employees; development of reserves and measures to increase labor productivity indicators; to determine the factors influencing the change of performance indicators.

Constant monitoring of changes in personnel utilization indicators plays an important role, for which multi-component assessments are used. The efficiency of labor resources utilization is related to labor costs and is determined based on the amount of work per employee and the costs incurred for them. The composition of labor costs is recorded in the financial statements of industrial enterprises. In determining the efficiency of labor resources utilization, it is recommended to use the labor cost growth rate index and the following formula is used:

$$I_{ich/ix(t)} = K_{ich(t)}/K_{ix(t)} \quad (2)$$

In this case:

$K_{ix(t)}$– The growth rate of labor costs in year t

One indicator reflecting the resource potential of industrial enterprises is determining the efficiency of using financial resources. The main characteristics that allow determining the efficiency of the use of financial resources are indicators of profitability and asset turnover. Analysis of the company's finances is an integral part of professional management. Therefore, the following are performed during the analysis process: the structure of sources of capital creation and the dynamics of changes are studied; factors leading to certain changes are identified; the value of certain sources of funds is determined; the level of financial risks is assessed.

To evaluate the effectiveness of equity capital, an indicator such as profitability is used, which reflects the profit ratio and the average annual value of capital balances. The level of solvency is assessed using liquidity indicators. To study financial stability and autonomy, various indicators are calculated, for example, the share of debt funds, the coefficient of autonomy, the coefficient of investment , etc. Thus, the study of the efficiency of spending the company's finances is based on the calculation of absolute and relative indicators that reveal various aspects of the financial sector.

The cost accounting of financial activities of industrial enterprises is reflected in line 170 of the financial results report and includes the following: interest on loans and debts received from banks and other organizations; interest on financial lease (leasing); negative exchange rate differences and losses on foreign currency transactions; losses from revaluation of funds spent on securities (subsidiaries, etc.); expenses associated with the issuance and distribution of personal securities; other costs of financial activity.

These indicators help to determine the effectiveness of the use of financial resources by enterprises.

Since the costs of financial activities consist of the main financial resources of the enterprise, the growth rate index can be used to evaluate the efficiency of financial resources.

It is recommended to use the following formula when determining the growth rate index for financial activity :

$$I_{ich/mf(t)} = K_{ich(t)}/K_{mf(t)} \quad (3)$$

In this case:

$K_{mf(t)}$ – The growth rate of expenses for financial activities in year t.

It is required to establish a measurement criterion for index evaluation . It is necessary to establish measurement criteria for assessing the material, labor and financial resource potential of enterprises. The integral indicator of the resource potential can be determined based on the average, minimum and maximum values of the indices of the resource potential assessment indicators. The following formula is used for this:

$$I_j = \frac{\sum_{i=1}^{n} I_{ij}}{n} \rightarrow (max, min, mode) \quad (4)$$

In this case: I am – integral indicator for year j;

I $_{work.}$ – indices of resource potential assessment indicators ;

n – number of pointers

$I_j \geq 1$ If so, the use of resources in industrial enterprises is effective compared to the previous year ;

$0 \leq I_j \leq 1$ if so, the use of resources in industrial enterprises is ineffective compared to the previous year ;

The proposed methodological approach is significant in that it can be used not only to determine the efficiency of the enterprise's resource use in the current and previous years, but also for comparison with other enterprises . The set of indicators is formed from the point of view of a single methodological approach, can be determined according to operational and statistical reporting data. It also allows for economic diagnostics of the enterprise's resource potential for the analyzed period and for making strategic decisions.

4. Discussion

The findings of this study highlight the importance of a structured, index-based assessment method in evaluating the efficiency of resource utilization in industrial enterprises. By integrating material, labor, and financial resource evaluations, the proposed methodology provides a more comprehensive and dynamic framework compared to traditional assessment approaches. The use of growth rate indices and a cumulative integral indicator allows enterprises to track performance over time and make data-driven strategic decisions. However, the applicability of the proposed method may vary depending on industry-specific conditions and data availability. Future research could focus on refining the model by incorporating additional resource efficiency indicators, such as technological innovation and environmental sustainability. Furthermore, expanding the methodology to include predictive analytics and machine learning techniques may enhance its accuracy and relevance in modern industrial settings.

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5. Conclusion

The method of assessing the resource potential of an enterprise requires a comprehensive, step-by-step and element-based study. It is also possible to expand the indicators to determine the efficiency of using material, labor and financial resources of industrial enterprises. The main methods of combining indicators are the use of aggregate indices. A distinctive feature of the proposed methodical approach for the comprehensive assessment of the resource potential of industrial enterprises is that its essence consists in a dynamic, flexible, indexical assessment of indicators for structural blocks.

For a comprehensive economic assessment of the efficiency of resource use of industrial enterprises, it is recommended to include the following in the system of indicators, including: the efficiency of use of intangible resources, the efficiency of use of information resources, the efficiency of use of innovative potential, etc. The use of index methods in assessing the efficiency of resource use is distinguished by the fact that it is faster than other analytical methods and can be carried out even in conditions of a lack of additional statistical data.

REFERENCES

[1] Davydenko, L. N. Innovative potential enterprise: model formation and management / L. N. Davydenko, Z. V. Bannikova. - Gomel: GGU im. F. Skoriny, 2014. – 240 p

[2] Dragun, N. P. Konkurentosposobnost pererabatyvayushchikh predpriyati APK: ekonomicheskaya suschnost i mechanism upravleniya / N. P. Dragun, E. M. Karpenko. - Gomel: GGTU im. P. O. Suhogo, 2009. – 246 p

[3] Nekhorosheva, L. N. Izmenenie innovatsionnogo landscape v kontekte formirovaniya Industrii 4.0: novye ugrozy i pervoocherednye zadachi / L. N. Nekhorosheva // Tsifrovaya transformation economy and industry: problems and perspectives / pod ed. It's Dr. Nauk, Prof. A. V. Babkina. - SPb. : Polytechnic. un-t, 2017. – S. 29–49

[4] Haustovich, N. A. Content-analysis of the effectiveness of resource use, innovation and development / N. A. Khaustovich // Effektivenost ispolzovaniya resursov innovatsionnogo kon-kurentosposobnogo ekonomicheskogo razvitiya / M. I. Nozdrin-Plotnitsky [i dr.]. - Minsk: Misanta, 2019. - S. 6–19

[5] Strijakova E. i dr. Pokaseteli otsenki effektivnosti ispolzovaniya resursov promyshlennyx predpriyatiy //Transportnoe mashinostroenie. – 2016. – no. 2 (50). - S. 232-243.

[6] Azanova N. Ekonomicheskiy mechanizm otsenki upravleniya risuksami promyshlennogo predpriyatiya //Rossiyskoe predprinimatelstvo. – 2014. – no. 2 (248). - S. 108-120.

[7] Kulish S. M. Analyz effektivnosti ispolzovaniya resursov i otsenka delovay activitiya sub'ektoprinimatelskoy deyatelnosti //Vestnik ekonomiki, prava i sotsiologii. – 2015. – no. 2. – S. 47-49.

[8] Park H. et al. Designing fair AI in human resource management: Understanding tensions surrounding algorithmic evaluation and envisioning stakeholder-centered solutions //Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems. – 2022. – S. 1-22.

[9] Shahbazi S. et al. Material efficiency in manufacturing: Swedish evidence on potential, barriers and strategies //Journal of Cleaner Production. - 2016. - T. 127. - S. 438-450.

[10] Walker S. et al. Evaluating the environmental dimension of material efficiency strategies relating to the circular economy //Sustainability. - 2018. - T. 10. – no. 3. - S. 666.

[11] Lopatin, Evgeniy. "Methodological approaches to research resource saving industrial enterprises." *International Journal of Energy Economics and Policy* 9.4 (2019): 181-187.

[12] Choi, Jun-Ki, Dillip Thangamani, and Kelly Kissock. "A systematic methodology for improving resource efficiency in small and medium-sized enterprises." *Resources, Conservation and Recycling* 147 (2019): 19-27.

[13] Romanusha, Yuliia, et al. "Improvement of methods for assessing the effectiveness of industrial enterprise management in the knowledge economy." *Journal of Hygienic Engineering & Design* 39 (2022).

[14] Orekhova, Svetlana, and M. Zavialova. "Methodology for assessing the resources of an industrial enterprise based on the concept of sustainable development." *E3S Web of Conferences*. Vol. 296. EDP Sciences, 2021.

[15] Thiede, S., G. Posselt, and C. Herrmann. "SME appropriate concept for continuously improving the energy and resource efficiency in manufacturing companies." *CIRP Journal of Manufacturing Science and Technology* 6.3 (2013): 204-211.