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**Information and analytical support for assessing the efficiency of using the
export-import potential of an enterprise**

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Abstract. The article is devoted to the issues of developing information and analytical support for assessing the efficiency of using an enterprise's export-import potential amid dynamic changes in the external environment, economic digitalization, and intensifying international competition. The relevance of the research topic is determined by the need to enhance the validity of managerial decision-making in the field of enterprises' foreign economic activity, ensure the objectivity of assessing the efficiency of the use of export-import potential, and improve information and analytical approaches for monitoring, diagnostics, forecasting, and enterprise development management. The study aims to develop theoretical and methodological provisions for the formation of information and analytical support for assessing the efficiency of using an enterprise's export-import potential.

The article examines scientific approaches to interpreting the essence of the concepts of “information support” and “information and analytical support” and identifies their role in the enterprise management system and in assessing the efficiency



of foreign economic activity. Theoretical provisions regarding the formation of a system of indicators and a feature space for the enterprise's export-import potential are investigated. It is substantiated that information and analytical support for assessing the efficiency of using export-import potential should be considered a comprehensive system that encompasses data, indicators, analytical methods, mathematical tools, software solutions, and managerial procedures to support effective decision-making. The classification of analytical information, requirements for the formation of the feature space of economic objects, as well as the system of complex and elementary features of the export-import potential of an enterprise, are presented. It has been revealed that the efficiency of using export-import potential is a multidimensional, multicriteria characteristic that requires modern analytical tools for assessment. The study of information and analytical support enabled the identification of the feasibility of using descriptive statistics, regression, factor, and canonical analysis, methods for constructing integral indicators, models of structural dynamics, rank correlation, forecasting, and multicriteria optimization. The main analytical tasks for assessing the efficiency of an enterprise's export-import potential are identified, including: analysis of trends in indicator development; determination of the level of potential development; assessment of structural dynamics; identification of cause-and-effect relationships; forecasting of indicators; and determination of reserves for improving efficiency. An approach to the formation of information and analytical support is proposed that, compared with existing approaches, ensures comprehensiveness, objectivity, and adaptability in assessing the efficiency of using an enterprise's export-import potential, and also contributes to improving the effectiveness of foreign economic activity management.

Keywords: potential, enterprise, export-import potential, information and analytical support, efficiency of potential utilization, foreign economic activity.



**Інформаційно-аналітичне забезпечення оцінки ефективності використання
експортно-імпортного потенціалу підприємства**

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Анотація. Статтю присвячено питанням формування інформаційно-аналітичного забезпечення оцінювання ефективності використання експортно-імпортного потенціалу підприємства в умовах динамічних змін зовнішнього середовища, цифровізації економіки та посилення міжнародної конкуренції. Актуальність тематики дослідження зумовлена необхідністю підвищення обґрунтованості управлінських рішень у сфері зовнішньоекономічної діяльності підприємств, забезпечення об'єктивності оцінювання ефективності використання експортно-імпортного потенціалу, а також потребою вдосконалення інформаційно-аналітичних підходів до моніторингу, діагностики, прогнозування та управління розвитком підприємства. Дослідження має на меті розвинути теоретико-методичні положення щодо формування інформаційно-аналітичного забезпечення оцінювання ефективності використання експортно-імпортного потенціалу підприємства.

У статті розглянуто наукові підходи до трактування сутності понять «інформаційне забезпечення» та «інформаційно-аналітичне забезпечення», визначено їхню роль у системі управління підприємством та оцінюванні ефективності зовнішньоекономічної діяльності. Досліджено теоретичні положення щодо формування системи показників та ознакового простору експортно-імпортного потенціалу підприємства. Обґрунтовано, що інформаційно-аналітичне забезпечення оцінки ефективності використання



експортно-імпортного потенціалу слід розглядати як комплексну систему, яка включає сукупність даних, показників, методів аналітичної обробки, математичних інструментів, програмних засобів та управлінських процедур, спрямованих на формування ефективних управлінських рішень. Представлено класифікацію аналітичної інформації, вимоги до формування ознакового простору об'єктів в економіці, а також систему складних та елементарних ознак експортно-імпортного потенціалу підприємства. Виявлено, що ефективність використання експортно-імпортного потенціалу є багатовимірною та багатокритеріальною характеристикою, оцінювання якої потребує застосування сучасних аналітичних інструментів. Дослідження інформаційно-аналітичного забезпечення дозволило виявити доцільність використання методів описової статистики, регресійного, факторного та канонічного аналізу, методів побудови інтегральних показників, моделей структурної динаміки, рангової кореляції, прогнозування та багатокритеріальної оптимізації. Визначено основні аналітичні задачі оцінки ефективності використання експортно-імпортного потенціалу підприємства, серед яких: аналіз тенденцій розвитку показників, визначення рівня розвитку потенціалу, оцінка структурної динаміки, виявлення причинно-наслідкових взаємозв'язків, прогнозування показників та визначення резервів підвищення ефективності. Запропоновано підхід до формування інформаційно-аналітичного забезпечення, який у порівнянні з існуючими, дозволяє забезпечити комплексність, об'єктивність та адаптивність оцінки ефективності використання експортно-імпортного потенціалу підприємства, а також сприяє підвищенню результативності управління зовнішньоекономічною діяльністю.

Problem statement. In the current conditions of globalization of the world economy, increased international competition, instability in foreign markets, and intensified integration processes, effective management of enterprises' export-import activities is of strategic importance. For industrial enterprises, export-import potential is an important factor in ensuring competitiveness, financial stability, expansion of



sales markets and integration into international production and logistics chains. At the same time, the effectiveness of implementing this potential largely depends on the quality of information and analytical support for evaluation, monitoring, forecasting, and managerial decision-making.

Modern conditions of enterprise functioning are characterized by high dynamism in the external environment; therefore, under such conditions, traditional approaches to assessing the effectiveness of the use of export-import potential do not provide the appropriate level of objectivity, complexity, and adaptability in management decisions. Of relevance is the problem of developing modern information and analytical support for assessing the effectiveness of using an enterprise's export-import potential, which would combine a system of indicators, methods of statistical, factorial, integral, and economic-mathematical analysis, and tools for forecasting, optimization, and diagnostics.

Despite a significant number of scientific papers devoted to the issues of information support of management, assessment of the efficiency of enterprises and the development of export-import potential, the formation of a comprehensive information and analytical system for assessing the effectiveness of the use of export-import potential, the construction of a hierarchical feature space of indicators, the determination of structural dynamics of potential and the application of modern analytical methods in the process of management. This necessitates further scientific substantiation of the theoretical and methodological foundations of information and analytical support for assessing the effectiveness of the enterprise's export-import potential, thereby determining the relevance of this study.

Analysis of recent research and publications. The problems of information and analytical support for enterprise management, the assessment of activity efficiency, and the development of export-import potential are the subject of research by many domestic and foreign scientists. Theoretical aspects of information support and information systems were studied by Stokoros T. M. [2], Denysenko M. P. [3], Sytnyk V. F. [4], Tsybulska E. I. [5], Tarasiuk M. V. [6], Khvalchuk I. L. [8], who revealed



the essence, functions and role of information and analytical provision in the process of managerial decision-making. The issue of digitalization of the economy and transformation of information processes is covered in the works of P. R. Putseneilo, O. O. Humeniuk [7].

Methodological approaches to assessing enterprise efficiency and the use of indicator systems are substantiated in the works of Drucker P. [9], Kaplan R. S. [10; 11], Phelps B. [13], and Neely A., Adams K., Kennerly M. [14]. The study of export and export-import potential of enterprises is devoted to the works of Kozmenko S. M. [15], Stychyshyn P. P. [16], Otenko V. I. [17], Hryenko P. O. [18], which consider the formation of indicator systems, evaluation of effectiveness, and diagnostics of export-import activities. At the same time, the issues of the comprehensive formation of information and analytical support for assessing the effectiveness of using an enterprise's export-import potential in the context of digitalization and dynamic changes in the external environment remain insufficiently studied.

Goal setting. The purpose of the study is to develop theoretical and methodological provisions for the formation of information and analytical support for assessing the enterprise's export-import potential.

Presentation of the main results of the study. One of the theoretical provisions in assessing the effectiveness of the enterprise's export-import potential is its objectivity, which is determined by the scientific validity of the information and analytical support.

Scientists believe that information support in accounting involves the creation of a single information fund, the systematization and unification of indicators and documents, and the development of means for the formalized description of data, etc. [1]. They also point out that information support is an important element of automated information accounting systems, designed to display information that characterizes the state of the managed object and serves as the basis for managerial decisions.



A clear and meaningful definition of support is provided by Stokoros T.M., who defines it as a dynamic system for obtaining, evaluating, storing, and processing data, created to support managerial decision-making [2, p. 299]. The scientist also points out the double meaning of this concept, namely, as both a process and a set of documents or other information carriers. Denysenko M.P. and Kolos I.V. define information support as a complex concept that covers a set of data, the organization of their input, processing, storage and accumulation, search, as well as dissemination within the competence of interested parties in a form convenient for them [3].

A well-known scientist in Ukraine for solving problems of information systems in the economy, Sytnyk V. F. [4], notes that information support contains information resources as a subject of labor, information as a product of labor, means and methods of maintaining the entire information base - the object of management.

At that time, Tsybul'ska E. I. defines information support as follows: it is the provision of management for making effective managerial decisions, with the necessary array of data obtained from incoming information flows, by organizing the technological process of information processing [5].

Tarasiuk M.V. considers information support as a functional complex of means, methods, and technologies that provides collection, search, grouping, analytical processing, storage, and dissemination of information data on the state and parameters of the functioning of objects in the context of the main indicators of the subject's activity with a certain frequency and in accordance with information needs [6].

In our opinion, it is the definition of scientists Putsenteilo P and Humeniuk O. that conceptually reflects the meaning of this concept. They believe that information and analytical support should be understood as the volume of information and its subsequent analysis necessary for the implementation of management at a certain hierarchical level within a specific period to achieve the goals and objectives of the managed system [7]. Furthermore, this management provision connects external and internal information systems to the enterprise's management systems and processes. In information and analytical support, all information is carefully selected, processed, and



analyzed, formed into indicators and recommendations for each level of enterprise management, with a list of specific actions of the manager in a particular situation. Scientists refer to software as a source of information and analytical support.

Khvalchuk I. L., Voloshchuk L. O. also investigated the problem of determining the information and analytical support of the system for managing the results of activities. In their understanding, information and analytical support is an interconnected logical system of selection and systematization of information about the state of the object of management to evaluate and diagnose relevant data for making timely, effective management decisions [8]. It should be noted that here, scientists in the analytical component do not consider tools, methods of information systematization, and diagnostics, but instead attribute the results of various types of analysis, which contradicts the definition of most scientists regarding the composition of information and analytical support.

Thus, information and analytical support refers to an object in the economy, therefore, information and analytical support for assessing the effectiveness of the use of EIPP is a system that provides for a set of data in the form of a hierarchical system of features, their values, i.e. indicators, organization of their receipt, processing, analytical tools and their implementation in software environments, analysis for the formation of an appropriate management decision.

The need for the development and use of information-analytical management methods was also discussed by P. Drucker [9], who believed that such methods provide managers with the necessary information. Considering the problems of information and analytical support for management as a whole or for individual management functions, it should be noted that an effective information and analytical method of management in an enterprise's economy is a balanced system of indicators. The founders of the balanced system of indicators are R. Kaplan and D. Norton [10, 11], who were the first to substantiate the need to use non-financial indicators in addition to financial indicators in the evaluation of the enterprise's activities and proved the property of this method to implement managerial functions: analysis, planning, organization,



regulation, stimulation, training, coordination, and control. In the process of applying the method at enterprises, the balanced system of indicators was improved and modified. And at present, there are many different forms and types of the balanced scorecard method.

In addition to the balanced system of indicators, other types of information and analytical methods are successfully used in the management of business entities. The ABC (Activity-Based Costing) method allows you to identify problems at the enterprise in relation to the cost of manufactured products, as well as specify the types of activities that lead to an increase in production costs; to solve the problem of how much the price of the product should be reduced in order to increase its sales [12]. Practitioners recommend introducing the ABC method into the enterprise's financial system and using it for the assessment and one-time analysis of production costs. While offering obvious advantages, this method is time-consuming to collect information and involves using many indicators when allocating overhead costs across different product types, processes, distribution channels, customers, and markets.

B. Phelps [13] substantiated the system of measures of enterprise performance, since it is the "correct" measurement systems that provide three basic principles of management: clarity (clear definition of the goal and reward for progress), objectivity (understanding of the key factors of the mechanism of value creation), and teamwork (concentration of efforts of all employees in one direction). Clarity or clear specificity is key to reducing costs and increasing efficiency. The disadvantage of this method is that financial indicators reflect the effectiveness of past decisions and are not guided by the factors that ensure the enterprise's future efficiency.

Performance measurement methods include the SMART pyramid, which is also considered a strategic measurement, analysis, and reporting method. E. Neely, C. Adams, and M. Kennerly [14] are the founders of the "prism of efficiency" method. They substantiated the advantage of this method – the focus on concentrating on critical problems of the enterprise. Domestic enterprises almost do not use this method.



Basically, the methods of measuring efficiency involve the implementation of four procedures, namely: 1) the development of criteria; 2) preparation for the implementation of the measurement system, more precisely planning the process of access to the necessary data, building a measurement system, developing a technology for processing and distributing data; 3) the use of criteria for understanding the processes at the enterprise; 4) improvement of the measurement system and monitoring of compliance of criteria with the goals of the enterprise. Long requirements are put forward for the system of measures: 1) a clear definition of the strategy, which is based on the opposition of current results with the factors-incentives of future activities; 2) development of metrics based on data and facts; 3) conducting an analysis in order to determine the effective factors that stimulate the activity of the enterprise; 4) understanding the impact of measurement systems on changes in behavior patterns.

The tasks of assessing the efficiency of the enterprise based on the SPS are:

- 1) study of the nature of the action of economic laws, determination of patterns and trends in the development of micro-level economic systems;
- 2) comprehensive justification of all processes and strategies of the enterprise;
- 3) control over the achievement of target benchmarks of activity, over the efficiency of the use of resources;
- 4) search for reserves to increase the effectiveness of the economic system of the enterprise;
- 5) increasing the efficiency of the current management of the enterprise;
- 6) development of the enterprise development plan;
- 7) comparative assessment in dynamics and in the aggregate of enterprises;
- 8) identification of strategic gaps;
- 9) simultaneous achievement of many criteria in the activity;
- 10) construction of an indicative control panel based on a hierarchical system of indicators.



Thus, modern information and analytical management methods at the enterprise depend on the level of development of measures, criteria, a system of indicators, and factors.

According to the definition of information and analytical support for assessing the effectiveness of the use of the EIP, it is a system that contains, first, a set of data in the form of a hierarchical system of features, their values, i.e. indicators.

It is known that analytical information in economics is classified according to the relevant characteristics: depending on the environment (external and internal information); depending on the use (primary, secondary information), depending on the source of its receipt (normative or standard information, planned, accounting and reporting information, non-accounting, reference information, research); depending on the form of presentation (oblique, quantitative, graphic information); depending on the stage of analysis (initial data, intermediate analytical information, effective or final information); depending on the level of management (macroeconomic, micro-level, information on the state of the lower levels of management); depending on the probability (accurate, approximate, inaccurate information to be verified); depending on the status of the source of information (official, unofficial information); depending on the usefulness (absolutely necessary, sufficient, superfluous information); depending on the degree of reach (open, closed information); depending on the time of assessment (past, future, prospective, current, operational information); depending on constancy (conditionally constant, variable information) [15]. To the features of classification of information in the economy can be added, depending on the conditions of certainty (definite or indefinite, clear or fuzzy information), and depending on the object of belonging (information about a property, phenomenon, or process).

The paper [6] formulates the requirements that are put forward for the formation of the feature space of objects in the economy, namely: the features should reflect the main properties of the object of modeling; the list of features should reflect the conceptual essence of the object; the system of features is hierarchical and consists of elementary and complex features; among the signs, indicators and criteria should be



distinguished; features are measured in metric and non-metric scales, which determines the choice of a mathematical method for modeling an object; signs can be determined in conditions of certainty and uncertainty; for further modeling of the trait, methods of descriptive statistics should be used; the relationships between the features of an object in the economy reflect the cause-and-effect mechanisms that are the basis of its life, development and management; Features are factorial, which makes it possible to identify key factors and effective features; Signs are explicit and latent, generalizing and integral. Here, it can be added that thanks to such a feature space, the implementation of the principle of heuristics in the process of economic and mathematical modeling is ensured, because with the help of dynamic series of values of these features, it is advisable to predict and optimize their levels, which is important in the process of managing an object in the economy. Observing these requirements, the levels of development of export-import potential and the efficiency of its use should express features that reflect the general properties of potential in the economy in accordance with the levels of management, types of management, elements of its structure, features of activity, functions, and in the processes of its implementation [16]. Moreover, the feature space should capture the content of the export-import potential, the efficiency of its use, and the conceptual model of this potential. When forming a sign space for the efficiency of using the export-import potential of an enterprise, it is necessary to take into account its definition as a system characteristic, which is presented as a ratio of effect to costs in the process of implementation, i.e., in the process of export-import activity and obtaining a positive effect, taking into account the strategies and goals of managing this potential.

It should also be considered that the export-import potential encompasses all available types of potential at the enterprise: resource, organizational, and management potential.

It is advisable to present the system of signs of export-import potential and the effectiveness of its use in a general form with the help of such a motorcade of complex and elementary features [17]:



$$O = \left\langle \begin{array}{l} O_{st}(e_1, \dots, e_k), O_{opr}(e_1, \dots, e_n), O_{om}(e_1, \dots, e_m), O_{of}(e_1, \dots, e_p), \\ K_{ef}, E_f, V_p, E_{fkEID}, E_{fkEIP} \end{array} \right\rangle, (1)$$

where $O_{st}(e_1, \dots, e_k)$ – are the signs of the structural components of the export-import potential;

$O_{opr}(e_1, \dots, e_n)$ – signs of potential processes;

$O_{om}(e_1, \dots, e_m)$ – signs of the mechanisms for the implementation of the EIPP;

signs of factors influencing external and internal environments on potential;

K_{ef} – performance criteria;

E_f – effect;

V_p – costs;

E_{fkEID} – efficiency of export-import activities of the enterprise;

E_{fkEIP} – efficiency of using the export-import potential of the enterprise

The formation of the feature space of export-import potential is a complex analytical process, but because of its implementation, a space of features is obtained, which is an objective basis for further use in processing using analytical methods and the development of effective management decisions and the implementation of all functions of managing this potential.

Many indicators in economics are statistical and are obtained from the study of mass social phenomena and processes carried out in statistical aggregates. Statistical indicators are values that reflect the characteristics of objects in the statistical population. For the most part, using statistical indicators, the analytical functions of management in the economy are carried out, namely: evaluation, analysis, diagnosis, monitoring, control, motivation, and stimulation.

The efficiency of using export-import potential is a multidimensional and multi-criteria characteristic. As for the criterion, it measures the reliability of the assessment



of the object's attribute in terms of its compliance with objective reality. And this is how the criterion is understood not only in economics, but also in other areas of human activity. As criteria, there can be both partial and integral indicators. Partial indicators are measured on different scales, namely metric and non-metric. Often, as criteria in the economy, there are partial indicators of effectiveness: efficiency of all activities, efficiency of various activities, efficiency of resource use, efficiency of use of various types of potential, etc. The general criterion is formulated as a target function that is minimized or maximized to obtain an optimal value. In the theory of decision-making, the criterion is a function or rule, with the help of which the preference of the decision-maker is expressed.

Export-import potential is a complex characteristic of an enterprise, comprising components that are themselves complex features at different levels of complexity, expressed through elementary features. For a comprehensive assessment of the level of development of these complex features, the entire export-import potential, and the efficiency of its use, integral indicators are used. Thus, the system of indicators of export-import potential contains partial and integral indicators. Partial indicators are absolute and relative values of elementary features and complex features. Integral indicators determine the values of complex features, the levels of development of characteristics, phenomena, and processes in the economy.

Scientists Otenko V.I. and Barannik I.O. believe that the system of indicators of the export-import potential of the enterprise should be structured into groups, namely: partial indicators of the state of the EIPP and the total potential of the enterprise that provides it, and partial indicators of the use of the EIPP [19]. But at the same time, scientists say that an enterprise's potential comprises the following types: resource, organizational, managerial, and functional, which are its components.

Hrynko P.O. recommends to include the following indicators in the system of partial indicators of the efficiency of export-import activity of a large industrial enterprise: export density of the enterprise in the foreign market; rate of change in supplies for export; level of product diversification of exports; profitability of exports;



share of the domestic market; coefficient of export efficiency; coefficient of import efficiency; coefficient of import efficiency; coefficient overdue liabilities; share of exports in the total volume of sales of the enterprise; profitability of sales; share of imports in the total volume of sales of the enterprise; the rate of change in imports; profitability of imports [20].

The export-import potential has a structure. It should be noted that there are only two main ways to manage the structure of export-import potential: maintaining it and changing it. The creation of new elements in the structure of export-import potential leads to changes in proportions and ratios among structural elements, as well as in ratios among existing structural elements. It should be noted that the development of export-import potential can be pursued both extensively and intensively. Extensive development of export-import potential involves quantitative growth of structural elements without changing their share in the structure, whereas intensive development of potential involves both structural changes and quantitative growth of elements. The tasks of structural change are related to the strategic tasks of managing the enterprise's export-import potential.

In assessing structural changes, it is advisable to consider the dynamics of these shifts and differences. Because structural shifts are changes in structure over time, and structural differences are differences between components at a particular moment in time, in the management of export-import potential, its state and movement as a system, along with its material form, should be considered and assessed. Therefore, to assess structural changes in the development of export-import potential, it is necessary to use a specialized set of mathematical methods that account for both structural shifts and structural differences.

To assess the dynamics of structural changes in export-import potential, it is necessary to analyze time series of indicators that reflect their elemental state and to establish the reference ratio of the orders of magnitude of their changes. Comparing the two rank orderings – actual and reference, it is possible to obtain consistency in the dynamics of the development of export-import potential. The integral coefficient is



calculated based on the Spearman and Kendall rank correlation coefficients. The Spearman rank correlation coefficient is based on rank deviations or differences, while the Kendall coefficient is based on rank inversions. It is believed that an estimate based on deviations characterizes the volumetric side of the movement, whereas an estimate based on inversions reflects structural dynamics.

To assess the elementary signs of the effectiveness of the use of export-import potential, it is first necessary to describe the data sets using the methods of descriptive statistics, namely: sample mean, median, mode, largest and smallest value of the value of the trait, percentiles, in particular, quartiles, variance, standard deviation, range of the population, interquartile scope, coefficient of asymmetry and excess, as well as plots of the law of distribution of values of the value of the trait - histograms, cumulative, block diagrams, frequency tables. Using descriptive statistical methods, the trend in changes in export-import potential indicators is assessed, allowing all these changes to be seen at once.

When applying analytical tools and economic and mathematical modeling, it is important to adhere to methodological principles: adequacy, dynamism, heuristics, and substitution. The principle of adequacy ensures the correspondence of the economic and mathematical model of the object in the economy, which is a condition for the objective truth of knowledge. According to the principle of dynamism, it is necessary to consider the variability of all the main elements of the modeling process, namely the goals of the study and the change of the object. According to the principle of substitution, the model should be considered only as an image of the original. The principle of heuristics asserts the model's ability to expand the reproduction of knowledge about a real object.

Thus, the following mathematical tools and analytical procedures should be included in the analytical support for assessing the effectiveness of the use of export-import potential: tools of mathematical statistics – for analyzing trends in the development of elements and components of the EIP; methods of multivariate regression analysis – for identifying factors of external and internal environments that



affect the EIP; methods of factor analysis and canonical analysis – for determining the impact rating indicators and cause-and-effect relationships between the state of export-import potential and its use at the enterprise; methods for constructing integral indicators, such as the taxonomic development indicator or Harrington's quality indicator – for calculating the integral indicator of the level of development of the EIPP; Spearman and Kendell rank correlation coefficients – for the development of an integral indicator of the structural dynamics of the EIPP; growth curve models – for forecasting the EIPP indicators, optimization models – for determining the optimal values of the EIPP indicators.

Thus, on the basis of the content of the assessment of the export-import potential and the effectiveness of its use, guided by the theoretical provisions of the assessment of the effectiveness of the use of the export-import potential of the enterprise, the choice of tools for its implementation, it is advisable to single out the analytical tasks that are presented in Table 1.

Therefore, to manage the processes of formation, development, and use of export-import potential, it is necessary to have an objective and reliable knowledge base about the enterprise's potential in general. The enterprise's knowledge base on potential should consider the multidimensionality and multi-criteria nature of economic objects, supported by the combined measurement of metric and non-metric features, as well as the inclusion of criteria in the management system for potential processes. This should be considered when developing both informational and mathematical models of enterprises' potential. For reliable monitoring, diagnostics, and evaluation in the enterprise's information systems, it is necessary to introduce qualitative capacity indicators, which are non-metric values.

Thus, the proposed approach to the formation of information and analytical support for assessing the export-import potential of an industrial enterprise enables a more complete implementation of its functions, namely: informativeness, organization, communicativeness, and integration. Such information and analytical support for



assessing the effectiveness of using industrial enterprises' export-import potential form a scientific basis and have practical significance for managing this potential.

Table 1

List of main analytical tasks for assessing the effectiveness of the use of export-import potential

Content of analytical tasks	Solution method	The result of the solution
1) Identification of the main features (elementary and complex) of the effectiveness of the use of export-import potential	Theoretical and logical analysis	Elementary main and secondary features. Feature space of models.
2) Analysis of trends in changes in the values of partial indicators (elementary features)	Descriptive statistics tools	Main trends in changes in indicator values
3) Determination of the general level of development of export-import potential, efficiency of its use	Methods for constructing integral indicators (taxonomic indicator of development, quality indicator)	The level of development of the components of the EIPP and its general level, the level of efficiency of use
4) Determination of the structural dynamics of the export-import potential of the enterprise and the efficiency of its use	Method for constructing an integral indicator of structural dynamics	Clarification of structural changes, structural dynamics of the EIPP
5) Determination of cause-and-effect relationships in the structure of export-import potential and factors of influence at the level of development and efficiency of use	Regression, factorial, canonical analyses	Causal relationships in structure, processes, mechanisms
6) Determination of optimal values of indicators to establish realized opportunities and efficiency of using export-import potential	Multi-criteria methods-Optimization	Optimal values of indicators
7) Forecasting the values of indicators of effective use of export-import potential to determine the trend of change and diagnose its development	Growth curve models	Forecast values of indicators
8) Determination of reserves for the effective use of the EIPP	Comparative analysis with reference and optimal values of indicators	List of reserves for the effective use of the EIPP

Source: author's development



Conclusions. Information and analytical support for assessing the effectiveness of using an enterprise's export-import potential is a complex, multi-level system that encompasses information resources, indicators, methods for processing analytical data, economic and mathematical tools, and software aimed at supporting sound management decisions. The effectiveness of using export-import potential is multidimensional and multi-criteria, requiring an integrated approach to its assessment. The expediency of forming a hierarchical system of signs and indicators, which allows consideration of the structural components of the potential, the processes of its implementation, the factors influencing the external and internal environments, as well as the results of the enterprise's export-import activities, has been demonstrated.

An important element of information and analytical support is the use of modern statistical, factorial, regression, canonical, and integral analysis methods, as well as methods of multi-criteria optimization and forecasting. Their application provides an opportunity to identify trends in the development of export-import potential, assess structural dynamics, establish cause-and-effect relationships, and determine reserves for improving its efficiency. The formation of the feature space of export-import potential provides an objective basis for constructing information and mathematical models for enterprise potential management. This allows you to implement monitoring, diagnostics, control, forecasting, and strategic management functions under conditions of uncertainty and external environmental dynamism.

The approach proposed in the study to the formation of information and analytical support for assessing the effectiveness of using the export-import potential of the enterprise contributes to increasing the validity of management decisions, ensures comprehensiveness of assessment, and creates a scientific and methodological basis for improving the system of management of export-import activities of enterprises in modern economic conditions.

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