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An integrated analysis of enterprise economy security

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A B S T R A C T

With the complication of the business environment of commercial economic activity, competition intensifies, which threatens the bankruptcy of enterprises, the prevention of which requires quality monitoring and timely identification of crises using methods of comprehensive assessment and analysis of economic security. This research is aimed at conducting component-by-component and, as a result, integrated assessment of the state of economic security of the enterprise. Methodological research tools include analysis of the main components, causation and vector regression modeling. A resource-functional security model is developed (which consists of partial indicators and components of economic security of business) and a resource-functional approach to calculations is also applied. Using the data of the expert survey, the values of indicators of structural components of economic security of the enterprise are determined. Using the resource-functional approach, the integrated values of sub-indices and the integral values of the general level of economic security of the enterprise are calculated. According to the results of the assessment, it is established that the integrated level of economic security of the enterprise is 7.04 (sufficient level of security). However, the components of economic security identified critically low values, namely - the financial component (0.452), the information component (0.554), the institutional and legal component (0.647). The results of the study are of practical value for the development of technological schemes - algorithms for strengthening the financial, informational and institutional and legal security of the enterprise, making sound (using economic and mathematical tools) management decisions to ensure the trajectory of sustainable economic development.

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1. Introduction

In today's financial and economic environment, information and analytical support is becoming increasingly important in the system of the effective management of enterprise development. Only based on a detailed comprehensive analysis, firstly, it is possible to fully assert the effectiveness of financial and economic activity; secondly, to monitor trends in internal and external environments; thirdly, to promptly identify the trajectory of probable negative direction of the development and realization of economic potential. Along with the actualization of the formation of a qualitative subsystem of financial and economic analysis, the issues of non-traditional calculation and diagnosis of general indicators of the financial and economic, and productive activity of enterprises as a comprehensive integral analysis, are becoming increasingly important, in other words – the analysis of such parameters as economic security, competitiveness, the realization of economic (or resource) potential, financial and economic stability, etc. The long-term and effective operation and enterprise development are grounded on strategic planning, based on senior executives' attempts to predict the results and factors of its operation, to prevent adverse events and enterprise exposure to risky situations. Therefore, today the issues of monitoring and formation of the information and analytical support for the management of enterprise economic security are becoming especially relevant.

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Given the fact that enterprise economic security is a complex economic concept and includes not only existing and planned indicators, but also is based on the past, it is important to develop modern qualitative methods for the comprehensive analysis of enterprise economic security, which would predict the assessment of the level of both partial components (particularly, financial, intellectual and personnel, technical and technological, institutional and legal, environmental, information, product, and defense ones), and the calculation of the integral index of enterprise economic security. Methods of comprehensive analysis of economic security of the enterprise solves a number of problems in developing a management system for the processes of its provision and strengthening. An information base is being formed, which includes a set of data on which it is possible to effectively establish the organization of measures to ensure economic security, monitor their implementation, and implement promising tools to improve the relevant management processes. The need to implement such a methodology is determined by the constant and often unpredictable changes in the system of market relations to which enterprises must adapt, while preventing threats and ensuring a sufficient level of economic security.

2. Literature review

A significant number of studies of the economic security of enterprises confirm its high relevance and practical value, as well as the dynamism and need for continuous improvement. Enterprise economic security has happened to be considered mostly in the context of defining the elemental composition of its support system and, accordingly, it is expected, on the one hand, to determine the impact of risks and threats that cause its deterioration, and on the other hand, to select components which can reduce such impact. According to this, the methods of analyzing enterprise economic security are changing. Despite the expansion of the study, the basic characteristics of enterprise economic security remain unchanged. Therefore, in the method of analysis of economic security of the enterprise are laid the scale of manifestation (competitiveness and the development of resource potential), the purpose of management (guaranteeing stable and most effective operation and development), the prerequisites of support (elimination of external and internal threats and risks), and the levels of management (the staff of strategic and operational management) (Vasyltsiv & Grynkevych, 2015). Nevertheless, an important aspect of the analysis of enterprise economic security is the choice of components to ensure and take into account the impact of the environment. It is clear that the level of economic security of the enterprise is largely due to foreign economic trends. Thus, when implementing the method of analysis of economic security of the enterprise is accepted to substantiate the influence of the market environment and the degree of its import dependence (Vasyltsiv & Lupak, 2016), the formation of a quality business environment in the domestic market (Rudnichenko, Dzhereliuk & et al., 2020), financial and economic system (Vykliuk, Mikhailishin & et al., 2020; Zagorodniy & Olikhovskyi, 2017), the formation of a system of basic state social standards and guarantees (Ilyash, 2015), migration trends (Levytska, Mulska & et al., 2020; Turchyn, Sobko & et al., 2020), technical and technological globalization and digitalization of the economy (Chukhray, Shakhovska & et al., 2020; Kraus, Zerniuk & Chaikina, 2020; Kutsyk, Lupak & et al., 2020).

At the same time it is worth noting the importance in the methodology of analysis of economic security of the enterprise taking into account aspects of public administration. The state is required to expand the domestic market capacity, in particular through the consumption of domestic high-quality competitive goods (Lupak, Boiko & et al., 2021), to ensure the high innovative activity of entrepreneurship (Kraus, 2014), to develop the institutional environment of the investment of capital and production factors (Akimov & Troschinsky, 2020), to implement investment and innovative projects (Ilyash, Yildirim & et al., 2020), and to regulate the processes of the optimization of the structure of funding sources, to establish and develop international scientific-technological and productive-investment cooperation (Bakulina, Lehan & Bakhov, 2019). Accordingly, all these factors must be taken into account when analyzing enterprise economic security. But, often, such trends are difficult to assess because of the absence of proper statistical information, non-agreement in program regulations, the lack of competencies, and low accountability of executive authorities. Therefore, it is important to rationally approach the formation of constituent elements of enterprise economic security, which will take into account the impact of both internal functional and foreign economic characteristics of economic activity.

The lack of single methods for analyzing enterprise economic security has led to the use of different approaches with the distinguishing of components, which in some approaches are individual elements, but in the others are divided or grouped, and in some cases may be absent at all. In particular, technical, technological and information support (Lupak, Kunytska-Iliash & et al., 2021; Chukhray & Shakhovska, 2019), financial, institutional and legal, product component (Gontareva, Babenko & et al., 2021; Zlotenko, Rudnichenko & et al., 2019), processes of ensuring force protection and protection of material values, intellectual and human resources (Dobina, Haidukevych & et al., 2019; Gontareva, 2016), procedures of observance of ecological norms of standardization and certification of activity (products) (Kwilinski, Ruzhytskyi & Bakhov, 2019). With full information support it is appropriate to use integrated analytical methods (Ilyash, Vasyltsiv & et al., 2021; Berezivskyi, Zbarsky, & Zbarska, 2021), which take into account a wide range of individual trends with coverage of the whole set of factors influencing the level of economic security. Thus, the analysis of economic security takes place with the use of various methodological approaches, in which the logic of choosing the components of the analysis of the level of entrepreneurial activity is mostly violated. The methodological schemes substantiating the system of ensuring the economic security of the state are used as a basis and the enterprise is analyzed according to such projection, in particular, a wide range of macroeconomic parameters is included in the calculation.

3. Methods

The prerequisite for the development of methods for the comprehensive analysis of enterprise economic security is the understanding that methodologically it should be considered as a system (*SofES*) that can be formally described by the equation:

$$SofES = \left\{T, P_t, Z_t^R, Z_t^P, I_t^L, I_t^Z, U_t^N, U_t^R, F_O, F_Z, F_U\right\}, \quad (1)$$

T – a set of time points t;

Pt – a set of indicators of enterprise activity at the time t;

Z_t^R, Z_t^P – sets of real and potential threats to enterprise economic security at the time t;

I_t^L – a set of local indicators of enterprise economic security at the time t;

I_t^Z – an integral indicator of the system of enterprise economic security at the time t;

U_t^N, U_t^R – sets of needed and recommended management decisions to ensure a sufficient level of enterprise economic security at the time t;

FO – an operator of finding estimates of the values of local indicators I_t^L of the system of enterprise economic security based on the values of Pt performance indicators and threats Z_t^R, Z_t^P:

$$I_t^L = FO(Pt, Z_t^R, Z_t^P), \quad (2)$$

FZ – an operator of finding estimates of the value of the integral indicator, I_t^Z of the economic security system based on the values of its local indicators I_t^L and the indicators of enterprise performance Pt and threats to security Z_t^R, Z_t^P:

$$I_t^Z = FZ(I_t^L, Pt, Z_t^R, Z_t^P), \quad (3)$$

FU – an operator of making management decisions $Ut = (U_t^N, U_t^R)$based on the estimates of the values of indicators I_t^L, I_t^Z of the economic security system, taking into account the performance indicators of enterprise activity Pt and threats to security Z_t^R, Z_t^P:

$$Ut = FU(I_t^L, I_t^Z, Pt, Z_t^R, Z_t^P). \quad (4)$$

The functioning of the economic security system of the enterprise is formalized as in Fig. 1.

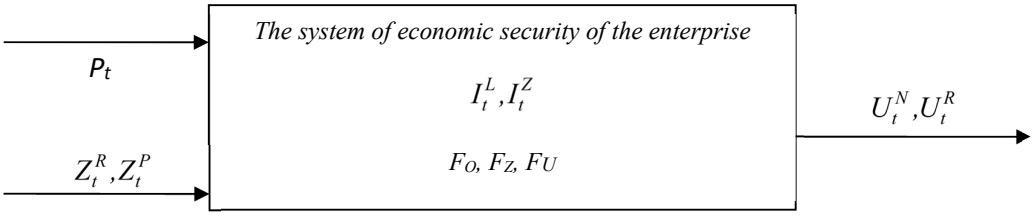

Fig. 1. Fundamental model of the economic security system of the enterprise

When studying the system of economic security, it is necessary to take into account various aspects of the enterprise. In this case, each side of the security system is characterized by different indicators, which can be represented in one way or another in quantitative terms. The analysis of research in this area has led to the conclusion that the construction of a set of indicators of the system of enterprise economic security is based on the following principles and requirements: completeness, minimality, meaningfulness, measurability, systemacity, acceptable risk. Thus, the assessment of the level of enterprise economic security is carried out according to the formula:

$$LofES = a1 \cdot f(x1) + a2 \cdot (f2) + \ldots + ai \cdot f(xn), \quad (5)$$

x1, *x2, … , xn* - indicators of enterprise activity; *f(x1), f(x2), … , f(xn)* - local functions of the dependence of the level of economic security on relevant indicators of the enterprise; *a1, a2, … , ai* - coefficients that reflect the importance of each indicator to ensure enterprise economic security. Along with undoubted advantages associated with the ease of result interpretation, this technique has several disadvantages. For example, there are no recommendations for the formation of a system of evaluation indicators; the types of local functions are not defined; to assess the overall level of economic security a linear model is used, which does not always adequately describe the dynamics of analyzed processes. To eliminate these and other shortcomings in the study, it is proposed to use a resource and functional approach to assessing the level of enterprise economic security. A resource and functional approach is a continuation of the indicator approach and is largely aimed at eliminating some shortcomings of the previous one. Thus, its main advantage lies in the fact that a resource and functional approach allows determining a comprehensive integral value of the economic security of business entities. But this is preceded by complex information and analytical work related to the selection of indicators, the substantiation of their limit values, and the calculations of actual indicators by all functional and structural components of economic security. Further, by each functional component of security, the integral value of its security level is determined which is an information base for defining an integral level of enterprise economic security. The calculations are based on determining the degree of deviation of the actual values of indicators from the limit ones, setting weighted coefficients (corresponding to the role of the indicator in ensuring economic security) of indicators, and identifying the sum of products of weighted values by the coefficients of deviation of actual values from limiting ones.

$$KofES = \sum_{i=1}^{n} k_i \cdot d_i \,, \tag{6}$$

KofES – an integral coefficient of security; *ki* – the value of a single criterion by *i*-component; *di* – the share of criterion significance; *n* – the number of components. An important methodical stage of the analysis is the rationing of indicators of enterprise economic security.

$$x\text{i} = \left(\frac{P_{i\phi}}{P_{i\text{н}}} \right)^{b} , \tag{7}$$

Piф, Piн - respectively actual and normative values of *i*-indicator; *b* - a level indicator (for the indicator of the type “minimum” it is equal to 1, for the indicator of the type “maximum” it is equal to -1).

The critical values of the initial indicators are determined based on the condition of the minimum allowable level of security, whose overcoming would mean the transition of the enterprise to an economically dangerous zone. According to the author’s generalizations of a system approach to the structure of enterprise economic security, its conceptual model of support takes the form:

$$\text{ES} = f \left\{ \begin{array}{c} (\text{FS}\ [f1; f2; \dots fn]) \\ (\text{IPS}\ [ip1; ip2; \dots ipn]) \\ (\text{TTS}\ [tt1; tt2; \dots ttn]) \\ (\text{ILS}\ [il1; il\ 2; \dots iln]) \\ (\text{ECS}\ [ec1; ec2; \dots ecn]) \\ \text{IFS}\ [if1; if2; \dots ifn]) \\ \text{PS}\ [p1; p2; \dots pn]) \\ \text{FOS}\ [fo1; fo2; \dots fon]) \end{array} \right\}, \tag{8}$$

ES – the integral index of enterprise economic security;

FS – the level of enterprise financial security (*f1* ; *f2* … *fn* – profitability and return; business activity; the stock of financial security; the term of the payment of accounts receivable; the term of the payment of accounts payable; liquidity; financial stability; the level of profit capitalization; income rate; the availability of financial resources);

IPS – the level of intellectual and personnel security of the enterprise (*ip1*; *ip2* … *ipn* – staffing; the level of remuneration; the level of staff qualification; staff turnover; the level of staff movement; the level of labor discipline; staff structure; intellectual level; staff stability);

TTS – the level of technical and technological security of the enterprise (*tt1*; *tt2*… *ttn* – material and technical security; the modernity of the material and technical base; the structure of the material and technical base; the use of the material and technical base of the main activity; the physical wear of the material and technical base; the moral wear of the material and technical base; the sources of the formation of the material and technical base);

ILS – the level of institutional and legal security of the enterprise (*il1*; *il 2*… *il n* – the availability of a structural unit for security guarantee; the quality of forecasting political and legal changes; the quality of forecasting and taking into account changes in legislation; the quality of interaction with authorities);

ECS – the level of environmental security of the enterprise (*ec1*; *ec2… ecn* – the quality control of materials; the quality control of types in the environment; the level of penalties for the violation of environmental regulations; the level of adaptation to environmental legislation);

IFS – the level of information security of the enterprise (*if1*; *if2… ifn* – the level of protection of the information from internal entities; the level of protection of the information from external entities; the quality of business intelligence; the quality of work with the media; the development of motivation to protect information; the quality of motivation of business management staff);

PS – the level of product security of the enterprise (*p1*; *p2… pn* – the level of product competitiveness; the level of demand; the dynamics of sale volume; the level of product value; the aggregate data of product quality; the innovativeness of the enterprise product);

FOS – the level of defense enterprise security (*fo1*; *fo2… fon* – the reliability of physical protection of business; the physical protection of personnel; the quality of interaction with law enforcement agencies; the quality of counteraction to criminal structures; the level of the protection of property and assets; the quality of functioning of the system of assets physical protection; the quality of legal guaranteeing of physical security; the quality of work motivation on the protection of business property and assets).

The testing of the author's methods of complex assessment of the level of economic security was carried out based on the enterprise "UnTekh", which operates in Ukraine. The main activities of the enterprise include the production and sale of plumbing equipment and facilities, as well as services for their installation, which are provided to both individuals and legal entities. Accordingly, the type, features, and scope of the enterprise activity affect most of the basic indicators and characteristics of economic security.

4. Results

4.1. The results of testing of the author's approach to the comprehensive assessment of the components of enterprise economic security

Let the authors evaluate each of the components of enterprise economic security. To do this, a preliminary study was conducted, which involved (1) determining the weighted coefficients of the functional components and the indicators of enterprise economic security and (2) the calculation of an integral indicator of the level of economic security. According to the survey results, the weighted coefficients of both functional and partial components of the economic security of this enterprise are identified, as well as the level of these indicators is assessed. Our results were used in compiling tables 1-9.

4.1.1. Financial component

The results of the assessment of this component of the economic security of the studied enterprise are presented in Table 1. The strengths of the enterprise by this component of its economic security include the average term of the payment of receivables (average score 6.5) and payables (7.0), the availability of access to financial resources (9.0), as well as the annual significant increase in the enterprise's income (9.5). Instead, the weaknesses include the low profitability and return of the activity (2.5), insufficient financial security (3.5), the level of liquidity and solvency (2.5), small net income (3.0). Table 1 shows that the level of the financial component of the economic security of MCEOE (Manufacturing Commercial Employee-Owned Enterprise) "UnTekh" is insufficient. The overall estimate of this indicator is 4.52 on a 10-point scale.

Table 1
The results of the assessment of the financial security of the MCEOE "UnTekh"

Indexes	Profitability and return	Business activity	The stock of financial security	The term of the payment of accounts receivable	The term of the payment of accounts payable	Liquidity	Financial stability	Availability and amount of net profit	The level of profit capitalization	Income rate	The availability of financial resources
Values of partial indicators*	2,5	4,5	3,5	6,5	7	2,5	4	3	6,5	9,5	9
Specific weights of significance of indicators, %*	9,25	6,75	18,13	6,63	6,63	14,25	15,5	8,13	4,5	4,5	5,73
Product of values of indicators and specific weights of significance	0,23	0,30	0,63	0,43	0,46	0,36	0,62	0,24	0,29	0,43	0,52
General assessment of the financial component of economic security of the enterprise											
4,52											

** here and further in tables 1-9 values of indicators are received by results of expert interrogation of employees of the device of management of the enterprise*

4.1.2. Intellectual and personnel security

Table 1 shows the results of the calculation of this component of economic security of MCEOE "UnTekh". The information in the table indicates a high level of this component of the security of the studied enterprise. The integral estimate of this indicator is 9.7 on a 10-point scale. At the same time, the management of MCEOE "UnTekh" need to work on improving the intellectual level of the staff, their skills, and improving the personnel structure at the enterprise.

Table 2
The results of the assessment of the intellectual and personnel security of the MCEOE "UnTekh"

Indexes	Staffing	The level of remuneration	The level of staff qualification	Staff turnover	The level of staff movement	The level of labor discipline	Staff structure	Intellectual level	Staff stability
Values of partial indicators	9,5	10	8,5	9	9	8	8,5	8	9,5
Specific weights of significance of indicators, %	15,63	10,38	18,25	19,75	3,5	15	5,13	15	7,38
Product of values of indicators and specific weights of significance	1,48	1,04	1,55	1,78	0,32	1,20	0,44	1,20	0,70
General assessment of the intellectual and personnel component of economic security of the enterprise									
9,7									

The other factors of the intellectual and personnel functional component of the economic security of this enterprise are acceptable (according to the analysis results). Almost all the factors received a maximum estimate according to the survey of experts. In particular, such indicators as the level of remuneration (10.0), the staffing of the enterprise (9.5), and staff stability are high at MCEOE "UnTekh" (9.5).

4.1.3. Technical and technological security

The level of this component of the economic security of MCEOE "UnTekh" is high, as the value of the integral indicator is 8.67 (Table 3).

Table 3
The results of the assessment of the technical and technological security of the MCEOE "UnTekh"

Indexes	Material and technical security	The modernity of the material and technical base	The structure of the material and technical base	The use of the material and technical base of the main activity	The physical wear of the material and technical base	The moral wear of the material and technical base	The sources of the formation of the material and technical base
Values of partial indicators	5,5	9,5	8	9,5	9	9,5	8,5
Specific weights of significance of indicators, %	13,13	25	8,75	12,5	20	13,75	6,87
Product of values of indicators and specific weights of significance	0,72	2,38	0,70	1,19	1,80	1,31	0,58
General assessment of the technical and technological component of economic security of the enterprise							
8,67							

The importance of the technical and technological component of economic security of MCEOE "UnTekh" is ensured by high values of such characteristics as a low level of physical and moral deterioration of the technical and technological base, a high level of the modern material and technical base of the enterprise, and a significant share of the latter in economic activity.

4.1.4. Institutional and legal security

The level of this component of the economic security of MCEOE "UnTekh" can be regarded as low. The calculated integral estimate by this indicator is 6.47 (Table 4). However, the estimate of the indicator "the availability of a structural unit of legal support of the enterprise activity" is high (9.63). Instead, to further increase the level of institutional and legal security, the management of the studied enterprise need to improve the work on forming relations with authorities and political organizations, as well as to introduce systematic work on forecasting political and legal changes in economic activity.

Table 4
The results of the assessment of the institutional and legal security of the MCEOE "UnTekh"

Indexes	The availability of a structural unit for security guarantee	The quality of forecasting political and legal changes	The quality of forecasting and taking into account changes in legislation	The quality of interaction with authorities
Values of partial indicators	9,63	5,38	6,38	4
Specific weights of significance of indicators, %	30,0	33,75	13,13	23,12
Product of values of indicators and specific weights of significance	2,89	1,82	0,84	0,92
General assessment of the institutional and legal component of economic security of the enterprise				
6,47				

4.1.5. Environmental security

The estimate of this component of the economic security of the enterprise is presented in Table 5. The table shows that this indicator is at a high level – 8.94.

Table 5
The results of the assessment of the environmental security of the MCEOE "UnTekh"

Indexes	The quality control of materials	The quality control of types in the environment	The level of penalties for the violation of environmental regulations	The level of adaptation to environmental legislation
Values of partial indicators	8,25	9	10	8,25
Specific weights of significance of indicators, %	22,5	27,5	27,5	22,5
Product of values of indicators and specific weights of significance	1,86	2,48	2,75	1,86
General assessment of the environmental component of economic security of the enterprise				
8,94				

4.1.6. Information security

Table 6 presents the partial factors and their estimate by the information functional component of MCEOE "UnTekh". As it can be seen from this table, the work carried out at the enterprise in this direction is insufficient, as the corresponding indicator is 5.54 on a 10-point scale. The management of the studied enterprise need to work on the introduction of work on business intelligence and the improvement of work on the coverage of information about the enterprise and its products in the mass media; improving the system of staff motivation.

Table 6
The results of the assessment of the information security of the MCEOE "UnTekh"

Indexes	The level of protection of the information from internal entities	The level of protection of the information from external entities	The quality of business intelligence	The quality of work with the media	The development of motivation to protect information	The quality of motivation of business management staff
Values of partial indicators	7,5	8,5	4,5	4	4	5
Specific weights of significance of indicators, %	12,5	17,5	26,25	10	15	18,75
Product of values of indicators and specific weights of significance	0,94	1,49	1,18	0,40	0,60	0,94
General assessment of the information component of economic security of the enterprise						
5,54						

4.1.7. Product security

The calculation of the level of this component of the economic security of the enterprise is presented in Table 7. Thus, the integral estimate of this indicator is 7.49, which is an estimated average. To improve the situation, the enterprise management need to work on increasing the level of the innovation of goods and services, stimulating their demand, reducing the cost, and increasing marketability.

Table 7
The results of the assessment of the product security of the MCEOE "UnTekh"

Indexes	The level of product competitiveness	The level of demand	The dynamics of sale volume	The level of product value	The aggregate data of product quality	The innovativeness of the enterprise product
Values of partial indicators	7,5	7	9,5	7,5	8	5,5
Specific weights of significance of indicators, %	22,5	30	7,5	17,5	17,5	5
Product of values of indicators and specific weights of significance	1,69	2,10	0,71	1,31	1,40	0,28
General assessment of the product component of economic security of the enterprise						
7,49						

4.1.8. Defense security

Table 8 shows the calculation of the level of the defense component of economic security of MCEOE "UnTekh". As it can be seen from Table 8, the level of defense security of the enterprise is acceptable. The estimate of this indicator is 7.49 on a 10-point scale. The strong aspects of this component of the economic security of the enterprise include the level of physical protection of the enterprise facilities, the level of crime prevention, and legal support for the protection of its property and personnel.

Table 8
The results of the assessment of the defense security of the MCEOE "UnTekh"

Indexes	The reliability of physical protection of business	The physical protection of personnel	The quality of interaction with law enforcement agencies	The quality of counteraction to criminal structures	The level of the protection of property and assets	The quality of functioning of the system of assets physical protection	The quality of legal guaranteeing of physical security	The quality of work motivation on the protection of business property and assets
Values of partial indicators	9	6,5	5,5	9,5	8,5	5,5	8,5	4,5
Specific weights of significance of indicators, %	22,5	7,5	7,5	12,5	12,5	12,5	12,5	12,5
Product of values of indicators and specific weights of significance	2,03	0,49	0,41	1,19	1,06	0,69	1,06	0,56
General assessment of the defense component of economic security of the enterprise								
7,49								

Based on the above calculations, according to Table 9, let the authors reckon the summarizing indicator of economic security of MCEOE "UnTekh".

Table 9
Calculation of the general level of economic security of the MCEOE "UnTekh"

Indexes	Functional components							
	Financial	Product	Intellectual and personnel	Technical and technological	Institutional and legal	Information	Environmental	Defense
Values of partial functional criteria	4,52	7,49	9,7	8,67	6,47	5,54	8,94	7,49
Specific weights of significance of functional components	24,4	18,8	10,0	13,8	5,0	6,9	5,0	16,1
The product of the value of partial criteria and their specific weights of significance	1,10	1,41	0,97	1,20	0,32	0,38	0,45	1,21
The general level of the internal component of economic security of the enterprise								
7,04								

Thus, the overall level of economic security of the investigated enterprise is 7.04, which can be regarded as a sufficient level of security. At the same time, the calculations show that the financial (4.52), informational (5.54), and political and legal (6.47) components remain the least guaranteed functional components of economic security. The low level of the financial component is especially negative because according to the expert survey the level of the weight of this component is the largest (24.4 %) and almost a quarter determines the value of the security integral indicator.

The high values of intellectual and personnel, and technical and technological components of economic security can be attributed to positive aspects, and product and defense components given the importance of these components can be attributed to satisfactory ones. Fig. 2 summarizes the results of the study described.

Security level	Level indicator	Functional component							
		Financial	Product	Intellectual and personnel	Technical and technological	Institutional and legal	Information	Environmental	Defense
Very high	over 0,7		0,749	0,97	0,867			0,894	0,749
High	0,5 – 0,7					0,647	0,554		
Average	0,3 – 0,49	0,452							
Low	0,2 – 0,29								
Very Low	0,11 – 0,19								
Minimum	0,06 – 0,1								
Supporting	to 0,05								

Fig. 2. Characteristics of the levels of functional components of economic security of the MCEOE "UnTekh"

It should also be noted that the largest possible reserve for strengthening economic security of MCEOE "UnTekh" remains with the following components: financial (1.34), product (0.47), defense (0.4), and information (0.31). The implementation of measures aimed at improving only these four parameters of the enterprise activity can increase the integral level of enterprise economic security to 9.5. The authors offer the management of MCEOE "UnTekh" (or the department of economic security of this enterprise) to use such methodical tools in practical activity. However, the list of indicators can be expanded by including additional ones by the other functional components of the enterprise. In addition, the enterprise must also form a database of indicators of major competitors, which will expand the functionality of monitoring and analysis of the indices and criteria of economic security of the studied enterprise.

4.2. Methodological and applied provisions for strengthening enterprise economic security

An important function of enterprise management (the department of economic security) within the implementation of the strategy and mechanisms for ensuring the economic security of the enterprise is the organization of a system of diagnostics and monitoring of this work. It should be understood as a systematic socio-economic assessment of the development level of the enterprise in terms of its economic security and the level of threats to its interests as a consequence of the inadequate level of economic security. The diagnosis of enterprise economic security should answer the question: whether and by which functional components the enterprise is in danger, what is the level of entry into this dangerous zone, which indicators are the most threatening to the interests of the enterprise in terms of the inadequate level of economic security. The diagnosis of the economic security of the enterprise is carried out during the monitoring of internal and external threats to the interests of the studied business entity. It is in the process of monitoring that changes occur, happening in the level of economic security of the enterprise, which most strongly affects its interests, causes, and factors that determine these threats. In general, the technology of economic security of MCEOE "UnTekh" based on the management of strategic interaction of the enterprise with the environment is presented in Fig. 3.

The stages of technology are the only purposeful process with the comparison of mathematical and information support in their relationship. Information is the link between the stages. Thus, it is possible to obtain a fairly adequate estimate of the implementation of an economic security system, which provides a systematic approach to the organization of comprehensive security of all business activities. In addition, it is necessary to use the entire available set of organizational, legal, and technological measures, which must be scientifically grounded and be advanced in their field.

The analysis of the economic security of MCEOE "UnTekh" requires appropriate methodical and organizational support. The methodical support of the analysis lies in the fact that it is carried out by operating the indicators used in the usual analysis of the state of the enterprise, as well as with the use of special additional indicators. The information must be comparable when confronting indicators at the beginning and at the end of accounting and forecasting periods, as well as when comparing actual and forecasting data with the quantitative parameters of the threshold values of enterprise economic security. It is especially important to ensure the comparability of information (in worthy terms), as well as to adjust the indicators that reflect an increase in sales in worthy terms to the level of price rise. (Fig. 4).

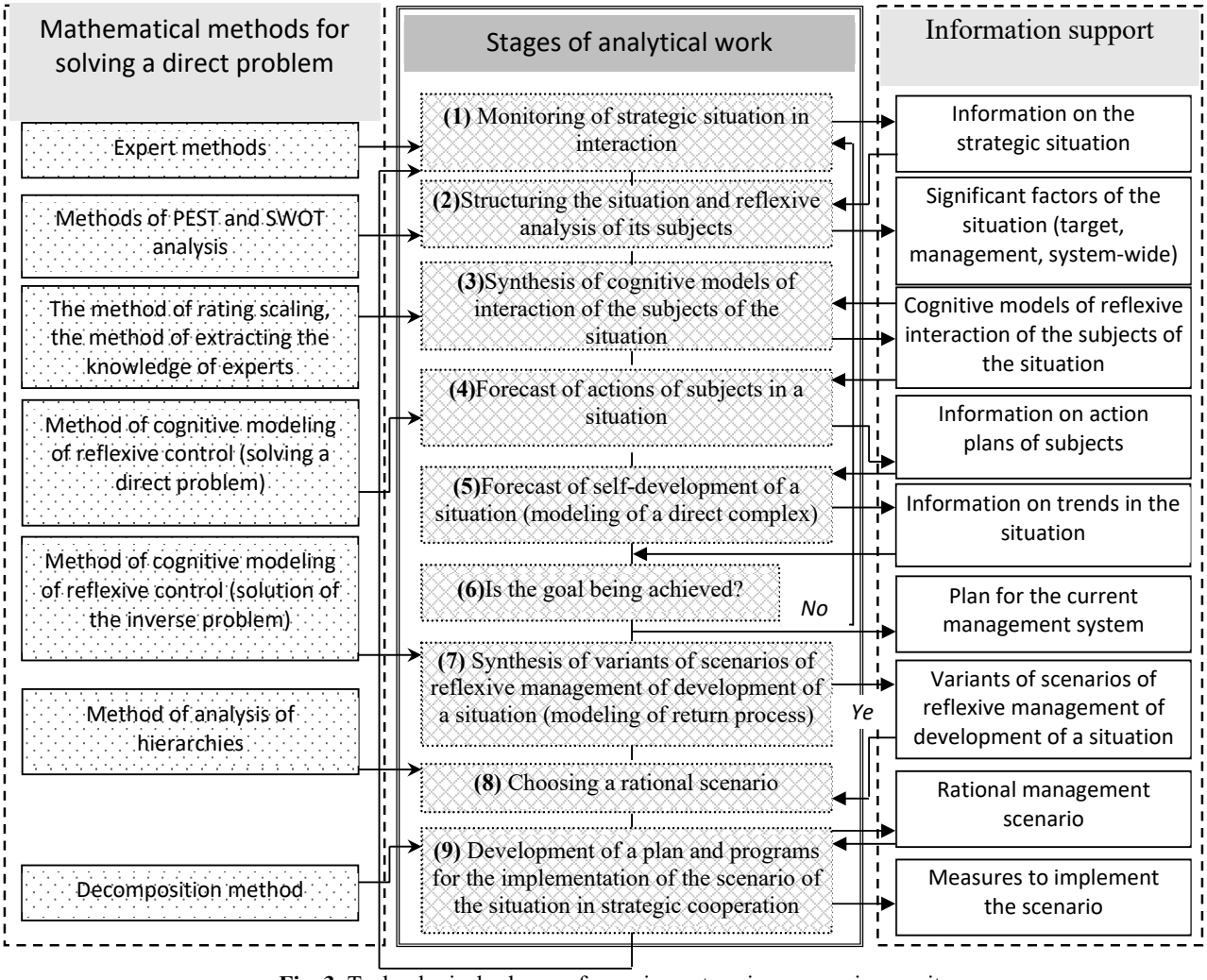

Fig. 3. Technological scheme of ensuring enterprise economic security

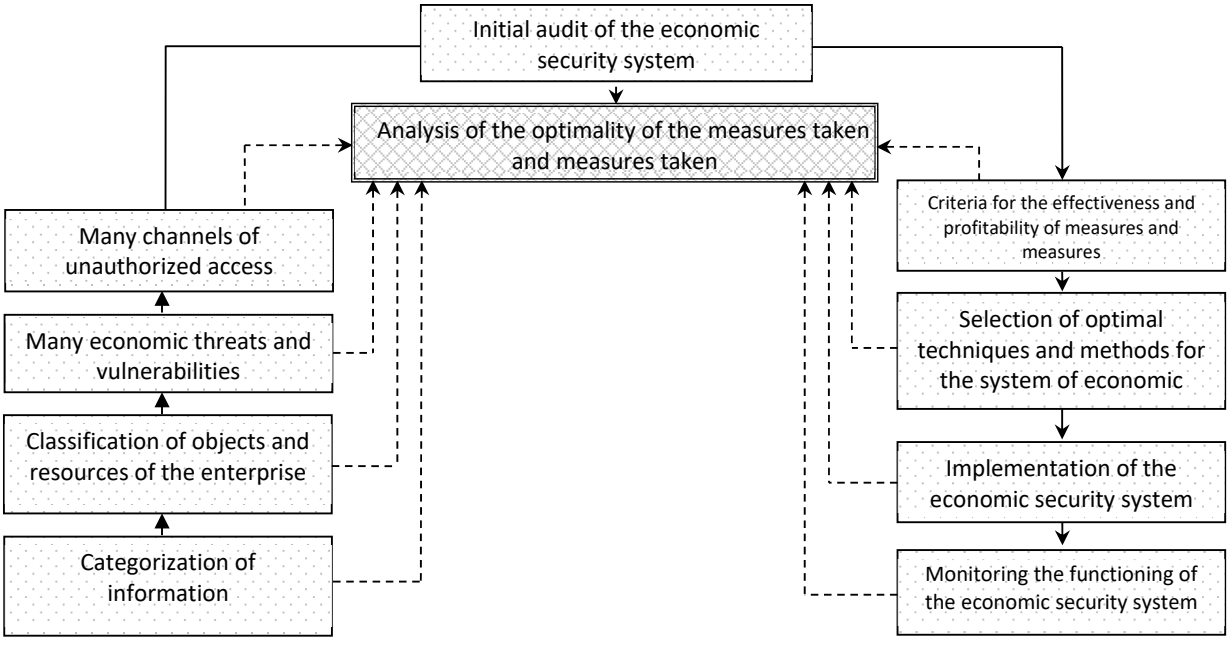

Fig. 4. Scheme of methods for building system enterprise economic security

The analysis of enterprise economic security and the creation of operational information and analytical system for monitoring the dynamics of the indicators of the development and security of the enterprise is important during the transition economy in the presence of significant macroeconomic and inter-sectoral disparities and quite a strong change and instability of socio-economic indicators. During monitoring, it is important not only to identify threats that have already arisen but also to identify and diagnose the most likely threats that may arise in the future.

5. Discussion

Based on the generalization of methodical principles and the structure of enterprise economic security, its functional components, factors, and sources of threats, a model of economic security in the form of a structural and functional system consisting of financial, intellectual and personnel, technical and technological, institutional and legal, product, environmental, information, and defense component is developed. This approach simultaneously guarantees the most efficient use of resources, intellectual and human potential; the stability of functioning, the stability and progressiveness of development; the availability of a permanent system of monitoring and counteracting the negative effects of the external and internal environment of the enterprise. The category of enterprise economic security should be considered exclusively as a system because otherwise its system-forming content to ensure the sustainable viability of the enterprise is lost. Accordingly, the model of the system of enterprise economic security contains objects that are subject to protection; entities; a set of principles; a provisioning mechanism; goals and objectives; functions, and strategies to ensure enterprise economic security. The author's approach to the multi-level system of assessment and monitoring of enterprise economic security is offered. It provides three levels and begins with the analysis of the primary indicators of economic security assessment; at the second level of work the analysis of indices that define a summarizing indicator is carried out; at the operational level of work the most important indicators of operational assessment are analyzed; at the third level – a summarizing indicator is determined, besides that, it can be not only a specific number of points but, for example, the market value of the enterprise, adjusted to the level of its economic security.

6. Conclusions

A component and integrated analysis of the state of economic security of the enterprise, which identified a generally sufficient level of security, but identified components of economic security of the enterprise, which are unsatisfactory and lead to a general weakening of its economic stability. As a result, it was found that the overall assessment of the level of economic security of the enterprise is 7.04 on a ten-point scale. The most possible reserve for strengthening the economic security of the enterprise in modern conditions of increasing competition in the domestic market of production and sale of industrial products of Ukraine remains for such security components as finance (strengthening financial stability and business liquidity, increasing return on investment), institutional and legal management system of economic security management of business) and information (improvement of the system of protection of industrial trade secrets of the enterprise). Implementation of measures in certain areas will increase the integrated level of economic security of the enterprise to 9.5, which will significantly improve the investment attractiveness of the enterprise. Taking into account the identified prerequisites for the operation of the enterprise, the priority areas for improving the mechanism of strengthening its economic security are improving the quality and level of resource provision, improving performance indicators, ensuring expanded reproduction of economic and resource potential. It is expedient to form a set of measures aimed at strengthening corporate protection of economic security in line with the prevention of external threats, ensuring internal security, the use of modern technologies in the economy and finance, and the organization of competitive intelligence.

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