

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
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UDC 658.5:012.7



**SCIENTIFIC AND METHODOLOGICAL SUPPORT FOR CONTROLLING IN
ENTERPRISE MANAGEMENT SYSTEMS**

Specialty 08.00.04 - Economics and Management of Enterprises
(by the type of economic activity)

SUMMARY OF THE DISSERTATION
(Doctor of Philosophy in Economic Sciences)

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Kyiv - 2015

SUMMARY

The work was performed at the Department of Management at the National Transport University of the Ministry of Education and Science of Ukraine, Kyiv.

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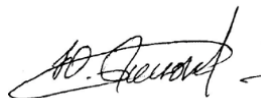
The public defense will be performed at 12:35 on June 26th, 2015, at meeting of the Specialized Academic Council K 26.059.04 at National Transport University, located at 01010, Kyiv, Suvorova St., 1, auditorium 333.

The thesis is available in the library of National Transport University at: 42 Kikvidze St., Kyiv, 01103.

The author's manuscript was sent out on '1st' May 2015.

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GENERAL CHARACTERISTICS OF THE DISSERTATION

Relevance of the topic. The financial and economic condition of modern enterprises in the context of the crisis of recent years is constantly deteriorating. One of the reasons for this situation is inefficient management, which leads to a loss of adaptive capabilities of an enterprise in a rapidly changing economic environment characterized by complexity and a high level of uncertainty. Under these conditions, there is a need to constantly improve the management system with new and effective tools. In the world of management science, controlling is considered to be one of the most advanced management tools in the changing external and internal environment. However, it is hardly implemented in Ukraine today due to insufficient scientific and methodological support. The key issues of the content and place of controlling in the management system, its main functions and tasks remain unclear.

A significant contribution to the study of the methodological foundations of controlling belongs to such foreign and domestic scientists as R. Mann, P. Horvath, J. Weber, T. Reichman, D. Schneider, H. Küpper, Y. Aniskin, O. Arefieva, L. Dyakon, D. Bayura, L. Chesnakova, O. Omelyanovich, N. Danilochkina, S. Falco, A.M. Karminsky, E. A. Anankina, L. A. Malysheva, O. Tereshchenko, G. Shvidanenko, I. Davidovich, A. Diarov, R. Dolinskaya, S. Ivakhnenkov, I. Ignatieva, D. Lozvitsky, M. Luchko, I. Markina.

The analysis of the scientific literature shows that most studies are devoted to the theoretical substantiation of controlling and the development of effective tools for solving its individual tasks. At the same time, the issues of developing methodological support for controlling in the face of external and internal threats remain insufficiently covered. Particularly noteworthy is the issue of improving the system of detection, assessment, analysis and development of preventive measures to prevent the negative impact of expected threats from the external and internal environments in the process of implementing enterprise's strategies. The relevance of the above issues and the objective need for further development of the studied issues for the theory and practice of controlling determined the purpose and objectives of the dissertation.

Relationship of the work to scientific programs, plans, topics. The dissertation was carried out in accordance with the theme of the research work of the Department of Management of National Transport University on the topic: 'Theoretical foundations for improving the management system of transport complex enterprises' (state registration number 0114U006585), within which the author developed scientific and methodological support for controlling in the enterprise management system.

Purpose and objectives of the study. The purpose of the dissertation is to theoretically substantiate and develop scientific and methodological foundations for preventive management of the implementation of enterprise strategies in the controlling system, which is aimed at improving the efficiency of strategic management, ensuring the achievement of its goals and objectives.

The following tasks were set in accordance with the goal:

- to classify modern approaches to the definition of a management category

‘controlling’;

- outline the content of controlling in the context of the concept of coordination;
- to formulate a system of operations and procedures of the controlling technology in the process of implementing strategic plans of the enterprise;
- to develop conceptual approaches to the functioning of the controlling system at the enterprise;
- to improve the mechanism for preventive detection of the most likely and dangerous threats to the external and internal environments of the enterprise's functioning in relation to the implementation of its strategies;
- develop a model for quantifying the extent to which external and internal threats affect the control points of strategy implementation.

The object of the study is the process of controlling at enterprises of the real sector of the economy (on the example of freight transport enterprises).

The subject of the study is the scientific and methodological support of controlling in the enterprise management system.

Research methods. The methodological basis of the study is based on modern general scientific and special methods of cognition. In the course of the study, the author used systemic and process approaches, methods of theoretical analysis and synthesis (to determine the essence of the concept of ‘controlling’); historical method (to study the sequence of development of controlling); analytical and statistical methods, including the method of financial ratios, comparison, sampling, grouping, averages (to assess the financial and economic condition of enterprises); descriptive model (to study the current state of the scientific problem and to analyze the results of implementation of controlling models); the method of abstraction and deduction (for improving the method of identifying threats from external and internal environments); expert method, regression analysis (for the formation of vectors of the most dangerous and probable threats), the method of analyzing hierarchies (when building a model for quantitative assessment of environmental threats); the formalization method (applied in the process of building block diagrams and presenting mathematical formulas); abstract-logical method (for making theoretical generalizations, forming conclusions and proposals).

The information base of the study is the main provisions and results of theoretical developments published in the scientific works of domestic and foreign scientists, materials of scientific and practical conferences, specialized periodicals and the Internet, as well as regulatory documents of the Ukrainian authorities, official materials of the State Statistics Service of Ukraine, and reports of road transport enterprises. Statistical analysis and experimental research were carried out using the Microsoft Excel computer program.

The scientific novelty of the obtained results lies in the theoretical substantiation and development of applied principles and recommendations for the functioning of the controlling system in the management of modern enterprises in the conditions of aggressive external environment. The most significant scientific results are as follows:

for the first time:

- conceptual approaches to the functioning of the controlling model in the context of the concept of coordination as a component of the strategic management system at

an enterprise that defines a technology for preventive detection of the most likely and dangerous external and internal threats, followed by their assessment by the extent of their impact on the strategy's control points, which allows developing and taking corrective measures in the course of strategy implementation to successfully achieve its goals;

has been improved:

- a mechanism for preventive detection of the most likely and dangerous internal and external threats to the implementation of the strategy, which, unlike the existing ones, allows to rank threats by the indicator of the integral level of importance. To calculate the indicator, an appropriate expert model is built, which provides for a comprehensive analysis of information on quantitative and qualitative indicators of the current state of the control points of the enterprise's strategy, indicators of the internal environment that may lead to negative consequences in the process of strategy implementation, and information on the current state of the external environment indicators, the dynamics of which may provoke the emergence or intensification of certain threats to the internal environment;

- a model for quantifying the degree of influence of external and internal environmental threats on the control points of strategy implementation based on the hierarchy analysis method. The developed model, in contrast to traditional statistical methods for determining the weighting coefficients for assessing environmental threats, allows to assess threats expressed in both quantitative and qualitative terms by the degree of their impact on the control points of strategy implementation, to take into account the interrelationships of external and internal threats and control points among themselves; to determine the quantitative impact of each individual external threat on each internal threat and each internal threat on each control point of strategy implementation, which provides a systematic approach to the threats assessment. The most probable and dangerous threats to the external and internal environment are determined by the 'level of global priorities';

have been further developed:

- Classification of modern approaches to the definition of a management category 'controlling', which includes conceptual and scientific and practical approaches. The conceptual approach distinguishes the concept focused on the information essence of controlling and the concept of coordination. Within the scientific and practical approach, three main areas are distinguished: the first interprets controlling as a management support system, the second as a separate management function, and the third as a technology or management tool. The content of controlling is most reasonably revealed by the conceptual approach and its concept of coordination;

- the conceptual apparatus of controlling, which in the context of the concept of coordination defines controlling as a separate preventive management activity, the subject of which is the coordination of plans at the stage of their implementation, due to frequent changes in the external and internal environments in which the enterprise operates;

- a system of operations and procedures of the controlling technology in the process of implementing strategic plans of the enterprise, including: monitoring the possible impact of threats from external and internal environments on the control points of the strategy, their accounting, evaluation, analysis, and interpretation in order to develop reasonable recommendations to prevent the impact of the most dangerous and probable threats.

Practical significance of the results. The developments presented in the study are of practical importance and can be used in the process of strategic management to form vectors of threats to the internal and external environments, to quantify their impact on the control points of strategies, which makes it possible to form a list of threats in respect of which preventive corrective actions should be taken to ensure the achievement of the goals and objectives of strategic plans. The developed approaches increase the adaptive capabilities of enterprises in the current conditions of their functioning, and allow to implement the principles of timeliness and preventive management actions. The elaborated methodical foundations and practical recommendations for the functioning of the controlling system at an enterprise are universal in nature and can be used at enterprises of various sectors of economy. The methodological approaches and recommendations for managing the implementation of strategies based on controlling principles proposed in the dissertation have been successfully implemented in the activities of REP-TRANS LLC (implementation act of 12. 09. 14), Ukrainian Logistics Provider LLC (implementation act of 28. 11. 14), PIK 'Trading Co. (act of implementation dated December 08, 2014).

The developed theoretical and methodological provisions are used in the process of teaching the disciplines 'Controlling', 'Financial Management', 'Strategic Management', 'Fundamentals of Management' at the Department of Management of National Transport University (implementation act of 04. 12. 14).

Personal contribution of the applicant. The dissertation is the result of an individual scientific research. The scientific provisions, methodological developments, conclusions and proposals set forth in it belong to the author personally and are his contribution to the development of the theory and practice of controlling at enterprises. The personal contribution of the applicant in the works published in co-authorship is:

- in the paper 'Expert Model of Formation of Threat Vectors of External and Internal Environments in Controlling' the author proposes the formation of threat vectors based on the criterion of the integral level of importance;

- The paper 'Conceptual Model of Controlling at an Enterprise' formulates operations and procedures of controlling technology in the process of implementing strategic plans of an enterprise.

- **Approval of the results of the dissertation.** The main provisions and results of the dissertation research were tested by the author at the international conference 'Science: Theory, Methodology, Practice' (Poland, Worcester, September 28-30, 2013); International scientific and practical conference 'Topical Issues of Economics and Management in Modern Conditions' (Dnipro, October 14-15, 2013). Xth International scientific and practical conference 'Development of entrepreneurship as a factor of growth of the national economy' (Kyiv, November 23, 2011); LXVII - LXX Scientific conferences of the Faculty at the National Transport university, (2011 -2014 years).

- **Publications.** On the topic of the dissertation 12 scientific works with a total volume of 3.5 printed pages were published, including: 7 articles in scientific professional journals, including 5 single articles, 1 article in a publication included in the international scientific and metric database Scopus, materials and abstracts of 5 scientific conferences.

Structure and content of the work. The dissertation consists of an introduction, three chapters, conclusions, a list of references and appendices. The main content of the dissertation is set out on 159 pages, including: 44 tables on 35 pages, 15 figures on 12 pages, including 2 on separate pages, 5 appendices on 20 pages. The list of references includes 151 items.

Key words: controlling, controlling system, economic conditions, internal threats, external threats, strategy implementation process, strategic control, coordination, monitoring, management accounting, control, economic forecast.

MAIN CONTENT OF THE DISSERTATION

The introduction substantiates the relevance of the topic of the dissertation research, formulates the goal and objectives, object and subject, defines the methodological basis and research methods, reveals the scientific novelty, practical significance of the results obtained and the personal contribution of the applicant, and provides information on the testing of the results.

In the first chapter **‘Theoretical Bases of Research on Controlling in the Management of Economic Activity of Enterprise’** the theoretical foundations for improving the system of strategic and operational management of enterprise in changing economic conditions are studied, the categorical apparatus of controlling is structured, the place of controlling in the management system is determined, the distinction and interrelation of the concepts of ‘control’, ‘controlling’, ‘coordination’ and ‘management accounting’ in.

In the course of the study, it was found that the systems of strategic and operational management operating at modern enterprises are characterized by complexity and low flexibility, untimely response to the threatening impact of changes in the external and internal economic environments, lack of mechanisms for continuous coordination and adjustment of strategic and operational plans, insufficient operational information support for management decision-making, lack of a well-established management accounting system, insufficient self-control of management, and lack of personnel motivation, a lack of attitude to scientific reflection, i.e. to self-improvement mechanisms of the organization.

The analysis of the theoretical foundations of strategic management has led to the conclusion that its main drawback is the imperfection of the system of strategic supervision (control of the future) aimed at identifying future events that may affect the implementation of the strategy. The problem of imperfection of strategic supervision can be solved by introducing the concept of controlling, which is a response to changes in the requirements for a modern management system in contemporary economic conditions.

The concept of controlling has gone through three stages in its development. From the end of the XV century to the 30s of the XX century, controlling was used to solve economic issues, financing and financial contributions. During the 30s-80s of the XX century, controlling became a flexible operational system of profit management that focused on the needs of consumers; since the 80s of the XX century, the emphasis has shifted to the comprehensive coordination of the enterprise's system of plans in accordance with changes in the external and internal environment of its functioning.

Despite its long history, the definition of ‘controlling’ still remains unclear. This greatly complicates the practical use of the system

controlling at modern enterprises. In all the variety of opinions, two main approaches can be distinguished: conceptual and scientific and practical. The conceptual approach, in its turn, covers two concepts: (a) the information-oriented essence of controlling, which considers it as an information system for decision-making support; (b) the concept of coordination, which interprets controlling as a system for coordinating enterprise plans. Within the framework of the scientific and practical approach to the interpretation of the concept of 'controlling', three main areas are distinguished: controlling as a management support system, as a separate management function, or as a technology or management tool. The content of controlling is most reasonably revealed by the conceptual approach and its concept of coordination, as such, which meet the objectives of improving strategic management.

The results of the theoretical analysis and generalization of modern research have made it possible to define controlling as a separate preventive management activity, the subject of which is the coordination of strategic and operational plans at the stage of their implementation, due to frequent changes in the external and internal environments in which the enterprise operates. Controlling that ensures coordination of long-term plans is strategic, and short-term plans are operational. Based on the essence of controlling, it is concluded that in the system of strategic management it improves and expands the function of strategic supervision or 'control of the future'. As a managerial activity, controlling includes: monitoring the possible impact of threats from external and internal environments on the control points of the strategy, their accounting, evaluation, analysis, and interpretation with a view to developing sound recommendations for preventing the impact of the most dangerous and likely threats.

In the course of the study, the differences and interconnection of the concepts of 'control', 'controlling', 'coordination' and 'management accounting'. It has been determined that control and coordination are components of the controlling functions, which are implemented in the process of monitoring the status of parameters of the internal and external environments and in the development of preventive measures to adjust the strategy. Management accounting acts as an information base for controlling, which accumulates information about the state of the internal and external environments, indicators of strategy implementation.

In the second chapter, '**Analysis of the State of Management of Transportation Enterprises and its Improvement based on Controlling**,' the author analyzes the efficiency of management at freight motor transport enterprises in Ukraine, forms a conceptual model of controlling, develops an expert model for forming vectors of probable and dangerous threats to the external and internal environments, as well as a model for quantifying the degree of influence of expected threats on the control points of the financial strategy.

The conducted analysis of indicators of financial and economic status of 15 medium-sized freight motor transport enterprises of Ukraine for 2011-2013 confirmed the theoretical conclusion about the insufficient efficiency of strategic and operational management systems. Moreover, the process of its decline has been identified.

Four groups of indicators were used to analyze the state of management of freight transport enterprises: the value of enterprises, their efficiency, solvency, business and investment activity.

The analysis of the value of enterprises showed that it tended to increase: the growth rate of the average value of an enterprise in 2013 compared to 2011 was 88.8%. However, the indicator of investment attractiveness tended to decrease: while in 2012 the ratio of profit to equity was 0.14, in 2013 it was 0.12. The core business activities of enterprises were also inefficient: in 2013, each hryvnia of net sales brought an average of four kopecks of losses to enterprises. It was only due to other operating activities, mainly operational leasing. At the same time, in 2011-2013, most companies' profitability did not exceed 5%. The dynamics of labor productivity was unstable: while in 2012 it grew by 33.4% compared to 2011, in 2013 it decreased by 16.2% compared to 2012. The current solvency of enterprises was characterized by an acceptable level of liquidity. Thus, the current liquidity ratio in 2013 at enterprises averaged 1.61 compared to 2.79 in 2011. However, the prospects for maintaining liquidity were uncertain. Thus, only nine companies out of fifteen had an autonomy ratio of more than 0.5. In 2013, the current assets turnover amounted to 430 days, up 33.8% compared to 2012. The dynamics of business activity was also unstable: while in 2011 the working capital turnover ratio was 1.6, in 2012 it was 2.1, and in 2013 it was 1.86.

On the basis of the formulated goals, objectives and functions of strategic controlling, the author develops its conceptual model, which provides for the preventive identification of threats to the organization's environment, their assessment by the degree of impact on the indicators of strategy implementation (control points) and ensuring a quick response to threats before the onset of undesirable consequences. The model includes three stages: preparatory, functional, and final. The preparatory stage involves the formation of a common set of control points of the strategy, the appointment of persons responsible for the implementation of the strategy, the distribution of control areas between them, and the formation of common arrays of threats to the internal and external environments. At the functional stage, the model provides for the formation by experts of the vectors of the most likely and dangerous threats to the external and internal environments of the enterprise in a certain period of strategy implementation and the process of their quantitative assessment by the degree of impact on the control points. Based on the obtained estimates, preventive corrective actions are developed in the process of implementing the company's plans. The final stage involves encouraging employees responsible for the strategy control areas to accumulate knowledge and experience in order to improve the control system.

To form the vectors of the most likely and dangerous threats to the external and internal environments, an appropriate expert model has been developed (Fig. 1), which allows to rank threats by the indicators of the integral level of importance.

It uses the following notation: z is the ordinal number of the expert, Z is the number of experts; j, k are the ordinal numbers of internal and external threats, respectively; μ is the ordinal number of internal and external threats in their aggregate array, Q is the aggregate number of internal and external threats; R_{gr} is the threshold value is the indicator of the integral level of importance; B, C are the vectors of the most dangerous and possible internal and external threats, respectively.

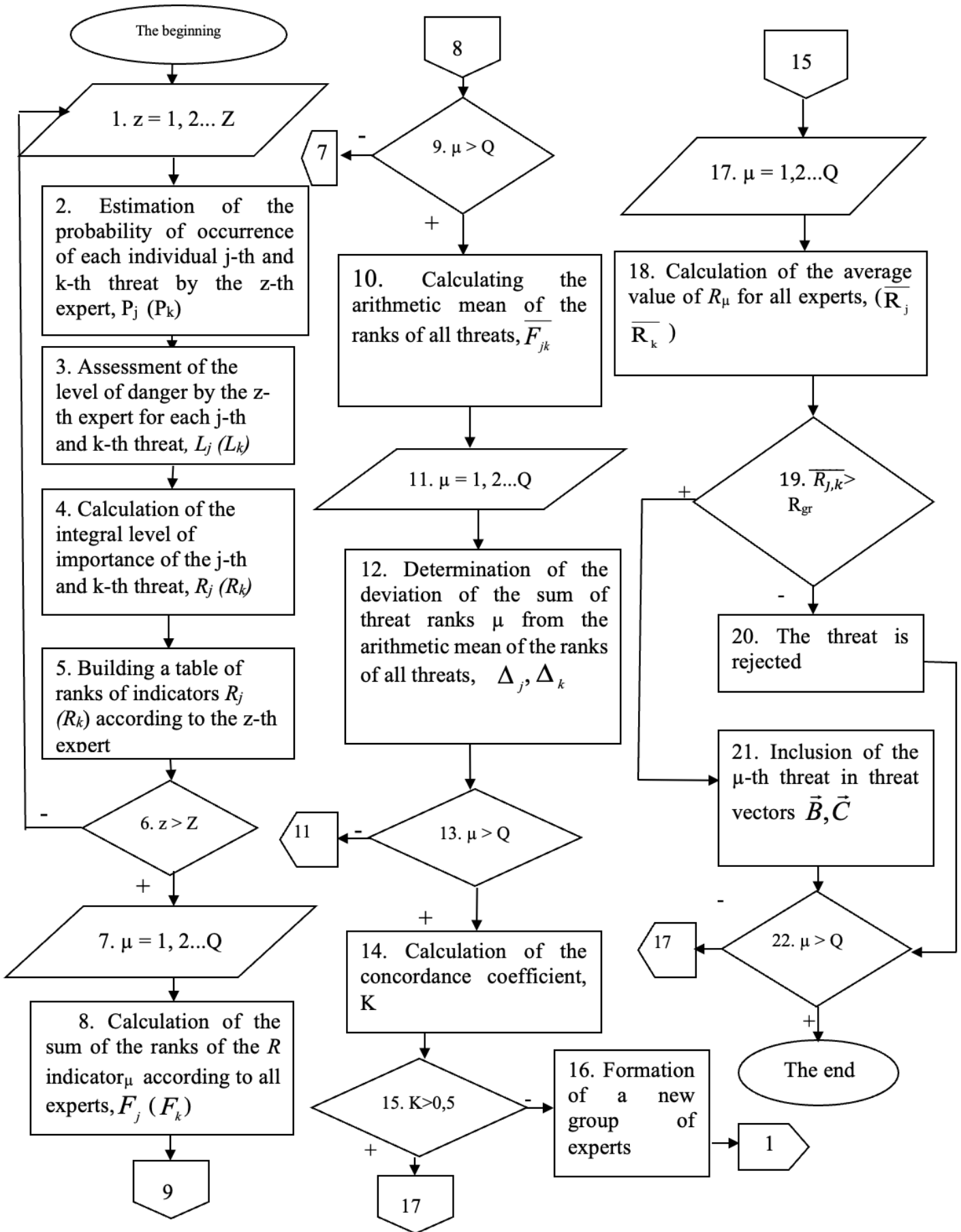


Figure 1 - Model of formation of vectors of probable and dangerous threats to the environment of enterprise functioning

*Author's development

Implementation of the model is preceded by determining the methodology of expert evaluation, establishing the frequency of the evaluation, appointing a circle of experts and determining the requirements for their qualifications and experience, justifying the number of experts, and formulating an individual expert questionnaire and instructions for filling it out.

At the stage of examination (blocks 1-6), experts assess the likelihood and danger of each threat, which allows them to determine the indicators of their integral level of importance. Based on each expert's assessment, a table of ranks is constructed separately for internal and external threats.

The next step is to check the consistency of the experts' opinions using the concordance coefficient (blocks 7-16). If the level of consistency is acceptable, the results of the examination are summarized (blocks 17-22): the average value of the integral level of importance of each individual threat is calculated; probable and dangerous threats are selected according to the criterion of the threshold value of the integral level of importance; vectors of external and internal threats are formed.

To quantify the impact of possible and dangerous threats of the external and internal environments on the control points of the strategy implementation, a corresponding model has been developed based on the hierarchy analysis method. The hierarchical model of control points and threats (Fig. 2) has four levels: the first covers the goal of the strategy, the second - its control points, the third and fourth - respectively internal and external threats.

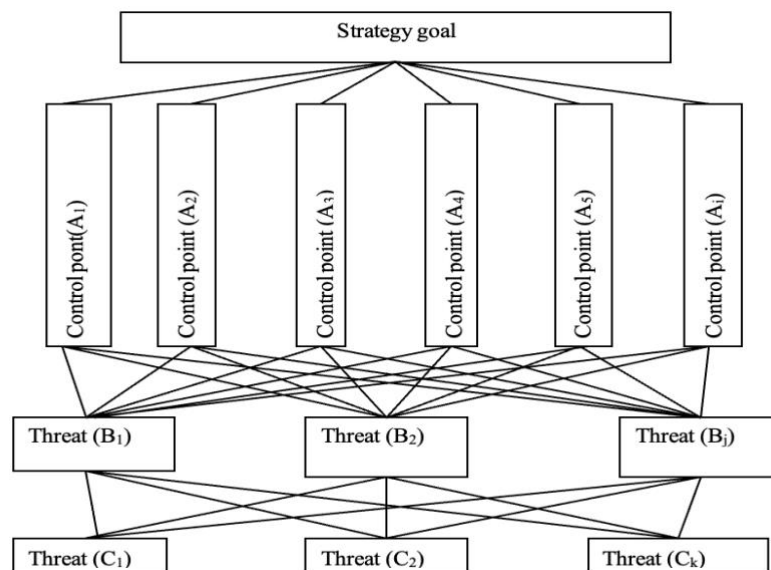


Figure 2 - Hierarchical model of links between control points of the strategy and threats to the environment of the enterprise

The evaluation model is shown in Fig. 3.

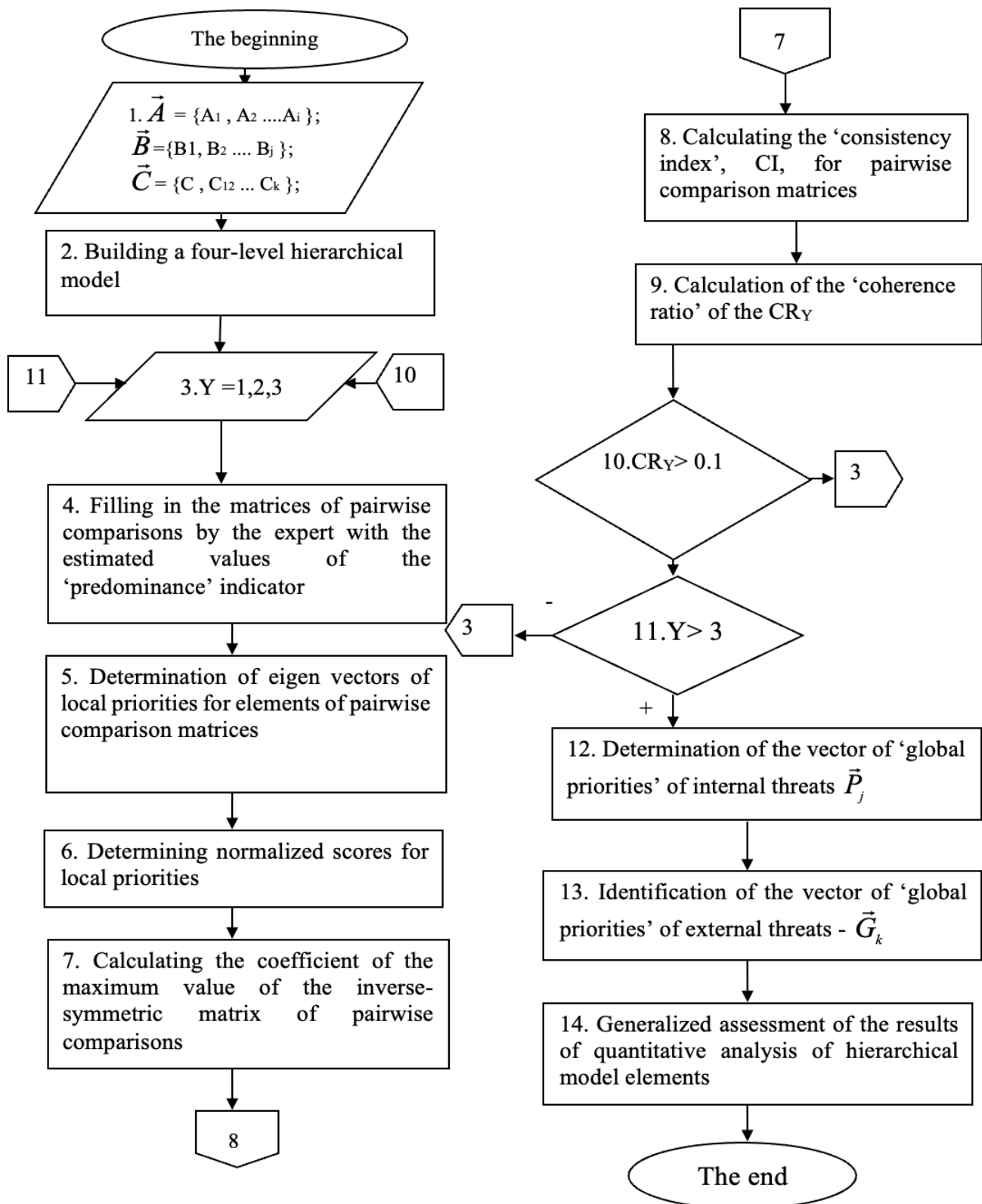


Figure 3 - Model of quantitative assessment of the impact of probable and dangerous threats of internal and external environments on the implementation control points enterprise strategies

**Author's development*

The index Y denotes the cycle of pairwise comparisons: '1' - elements of the second level of the hierarchy; '2', '3' - elements of the corresponding third and fourth levels of the hierarchy according to each control point. First, based on the results of the examination, a hierarchical model is built with a specified number of control points, internal and external threats, and established links between them (blocks 1-2). Based on this model, the expert determines the 'predominance indicator' fills in the matrices of pairwise comparisons (block 4), after processing the data (blocks 5-9) the consistency of the expert's assessments (the Coherence ratio) is checked (block 10). If the 'Coherence ratio' indicator is less than or equal to 0.1, the assessments are considered reliable. After obtaining consistent scores for the three levels of the hierarchy (block 11), global priorities for internal and external threats are calculated (blocks 12-14):

$$P_j = \sum_{i=1}^n U_i W_{ij} \quad (1)$$

P_j - is the global priority of the j-th internal threat of the third level in relation to the i-th control point of the second level; U_i - element of the eigenvector of local priorities of the i-th control point; W_{ij} - element of the eigenvector of local priorities of the j-th internal threat relative to the i-th control point of strategy implementation; n - number of strategy control points of the strategy..

$$G_k = \sum_{j=1}^m P_j Z_{jk} \quad (2)$$

where G_k - is the global priority of the k-th external threat; Z_{jk} is an element of the ownis the vector of local priorities of the k-th external threat in relation to the j-th internal threat; m is the number of internal threats.

The level of global priorities determines the extent to which threats affect the strategy's control points, which allows identifying those threats that may negatively affect the strategy's control points in the near future.

The third section, '**Implementation of the controlling models in the conditions of a freight transport enterprise**', presents the results of assessing the reliability and possibilities of practical use of the developed scientific and methodological support for controlling at the enterprise in the real economic conditions. To carry out assessments based on the developed models, software in the Microsoft Excel environment has been formed, which allowed to conduct an experimental study on the data of a private enterprise of private ownership PIC 'Trading Co'. Its main activities are the transportation of goods and passengers through the territory of Ukraine.

The financial strategy of the company in terms of freight transportation was chosen for the experimental study. The experiment is a passive and controlling one. The objective time of its conduct was the second quarter of 2014, during which three monthly experiments were conducted, which made it possible to identify the most likely and dangerous threats of the internal and external environment at the beginning of each month of the quarter before their occurrence, to assess the quantitative impact of threats on the control points of the strategy and to develop appropriate measures to prevent their negative impact.

The financial strategy's control points determined the budget indicators profits and losses from freight transportation: A1 – revenue from the sale of transport services; A2 – production

cost of the implementation of motor transport services; A3 – management costs; A4 – commercial expenses. The threats of the internal environment are the expected negative deviations of the indicators of the general production overhead budgets, administrative, commercial costs, direct material costs and labor costs, and the sales budget. Their total number was 11.

Threats of the external environment in the number of 13 are indicators of the external environment that affect control points and increase internal threats. The results of expert assessments based on the relevant model allowed us to predict the following vector of the most likely and dangerous internal threats for April 2014: B₁ - a decrease in sales; B₃ - an increase in material costs per 1 km of transportation work; B₁₀ - an increase in variable commercial costs; B₁₁ - an increase in fixed costs of the marketing department.

The vector of the most likely and dangerous external threats includes: C₁ - falling demand for transportation; C₂ - increasing market share of competitors; C₅ - rising inflation; C₆ - increasing cost of spare parts; C₇ - increasing cost of fuel; C₈ - rising utility tariffs.

The generalized estimates of the degree of influence of threats on the control points of the financial strategy by the hierarchy analysis method are presented in the form of matrices of normalized estimates of local and global priorities of the vectors of internal (Table 1) and external (Table 2) threats.

Table 1 - Matrix of normalized estimates of local priorities of internal threat vectors and their global priorities

Normalized estimates of local priorities of controlling points	Internal threats	Normalized estimates of local priorities of internal threat vectors				Global priority
		A1	A2	A3	A4	
0,6490	B ₁	0,5751	0,0634	0,0634	0,0634	0,4183
0,2060	B ₃	0,2838	0,2206	0,2206	0,2206	0,1525
0,1048	B ₁₀	0,0740	0,1179	0,1179	0,1179	0,0340
0,0402	B ₁₁	0,0671	0,5981	0,5981	0,5981	0,3844

According to Table 1, the greatest negative impact on the control points in April 2014 should be expected from the threat of a decrease in cargo transportation in Ukraine and an increase in fixed costs of the marketing department of the enterprise: the values of global priorities for these threats were 41.8% and 38.4%, respectively.

Among the external threats (Table 2), the greatest negative impact on the internal threats and control points are possible from the threats of falling demand for transportation and increasing market share of competitors, as they have the highest global priorities, 37.1% and 28.3%, respectively.

Table 2 - Matrix of normalized estimates of local priorities of external threat vectors and their global priorities

	The vector of global priorities of internal threats	
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External threats	0,4183	0,1525	0,0340	0,3844	Global priority of external threats
	Normalized estimates of local priorities of external threat vectors				
	B1	B3	B10	B11	
c1	0,3790	0,3790	0,3790	0,3790	0,3714
c2	0,2894	0,2894	0,2894	0,2894	0,2836
c5	0,0931	0,0931	0,0931	0,0931	0,1412
c6	0,1269	0,1269	0,1269	0,1269	0,1469
c7	0,0762	0,0762	0,0762	0,0762	0,0284
c8	0,0353	0,0353	0,0353	0,0353	0,0132

According to the results of the May 2014 experiment, the vector of internal threats has changed significantly. It includes the following threats: reduction in the selling price of services, increase in electricity costs, and increase in the cost of fixed assets repair. It was determined that the elements of the vector can have approximately the same negative impact on the control points of the financial strategy: the global priorities of threats were 37.9%, 34.3% and 27.8%, respectively.

Among external threats, the most likely were the threat of a drop in demand for transportation with a global priority (29.9%) and the threat of an increase in the cost of spare parts (29.8%).

According to the results of the June experiment, it was expected that the most likely threat this month would be the internal threat of a decrease in transportation volume: its impact on the control points was 62.5%. A much smaller impact was expected from the threat of increased material costs, as its global priority was 23.9%, and from the threat of increased variable commercial costs - 13.4%.

The external threat of a decline in freight transportation in Ukraine could have a significant impact on the increase in internal threats in June, as its global priority was 54.8%. The possible impact of other threats was assessed in a similar way: an increase in inflation - 17.7%, an increase in the cost of spare parts - 16.1%, and an increase in the cost of fuel - 11.0%.

On the basis of the experiments performed, the management developed and adopted appropriate measures to prevent the negative impact of threats on the implementation of the company's financial strategy. This made it possible to evaluate the results of the experiment by comparing the actual values of the strategy's control points in the second quarter of 2014 with their forecast values: revenue from transportation services increased by 3.4%, production cost of services decreased by 3.6%, administrative expenses decreased by 6.1%, and selling and distribution expenses - by 10.9%. At the same time, the company's loss from freight transportation decreased to UAH 1,470 thousand compared to the forecasted value of UAH 1,673 thousand.

An experimental study has confirmed the reliability of the developed scientific and methodological support for controlling at an enterprise and has shown the following capabilities of forecasting models:

- monthly forecasting of the most likely and dangerous threats to the external and internal environments in relation to the achievement of strategic goals;
- ranking threats by the degree of impact on control points;
- promptly adjusting measures to implement the company's strategies;
- studying the dynamics of threats in terms of their impact on the implementation of enterprise strategies.

CONCLUSIONS

The dissertation summarizes and solves in a new way the scientific and practical task of enterprise management on the basis of controlling in the context of changing external and internal economic environments. The results of the study allowed to formulate conclusions of conceptual and practical direction:

1. Modern approaches to the definition of the management category are classified 'controlling'. Two main approaches are distinguished: conceptual and scientific and practical. The conceptual approach includes the concept of coordination and the concept focused on the information essence of controlling, which considers it as an information system for decision-making support. Within the scientific and practical approach, three main areas are distinguished that interpret the concepts of 'controlling' as a management support system, as a separate management function, as a technology or management tool. The content of controlling is most reasonably revealed by the conceptual approach and its concept of coordination, which interprets controlling as a reflection of management or 'management by management', which consists in constant self-improvement of the management system in the face of high uncertainty and variability of the external and internal environments of the enterprise.

2. The content of controlling in the context of the concept of coordination is outlined. The results of the theoretical analysis and generalization of current research have allowed to define controlling as a separate preventive management activity, the subject of which is the coordination of plans at the stage of their implementation, due to frequent changes in the external and internal environments in which the enterprise operates. It is determined that by its very nature, controlling provides reflection in the management system by improving the process of implementing enterprise strategies. Controlling, which ensures coordination of long-term plans, is strategic, while coordination of short-term plans is operational.

3. The system of operations and procedures of controlling technology in the process of implementing strategic plans of an enterprise is formed. Based on the essence of controlling, it is concluded that in the system of strategic management it improves and extends the function of strategic supervision or 'control of the future'. Controlling as a management activity covers a system of operations and procedures, which includes: monitoring the possible impact of external and internal threats on the strategy's control points, their accounting, evaluation, analysis, and interpretation in order to develop reasonable recommendations to prevent the negative impact of the most dangerous and likely threats on the strategy's implementation.

4. Conceptual approaches to the functioning of the controlling system have been developed, on the basis of which a corresponding model has been formed, which provides

for the preventive detection of threats to the organization's environment, their assessment by the degree of impact on the indicators of strategy implementation and ensuring a quick response to threats before the onset of undesirable consequences. The model includes three stages: preparatory, functional and final. The preparatory stage involves the formation of a common set of control points for strategy implementation, the appointment of responsible persons for strategy implementation and the distribution of control areas among them, the formation of common arrays of internal and external threats affecting control points, and their quantitative values. At the stage of operation, the model provides for the formation of vectors of the most likely and dangerous threats to the external and internal environments of the enterprise in a certain period of strategy implementation by experts; quantitative assessment of the degree of influence of the formed threat vectors on the control points of the strategy and their ranking; development of corrective actions in the process of strategy implementation. The final stage of controlling includes encouragement of employees responsible for the strategy control areas, accumulation of knowledge and experience in order to improve the controlling system.

5. The mechanism for preventive detection of the most likely and dangerous threats to the external and internal environments of enterprise functioning in relation to the implementation of its strategies has been improved, based on an expert model for forming vectors of expected threats by the indicator of the integral level of importance. Implementation of the model involves determining the methodology of expert evaluation, establishing the frequency of examination, appointing a circle of experts and determining the requirements for their qualifications, and justifying the number of experts. Based on the experts' assessments of the likelihood and danger of each threat, the indicator of the integral level of importance of the threat is determined, which is used to build the corresponding threat vectors for each expert. If the level of coherence of experts' opinions, as assessed by the concordance coefficient, is acceptable, the results of the examination are summarized, the most likely and dangerous threats are selected according to the criterion of the threshold value of the integral level of importance, and the vectors of the most likely and dangerous internal and external threats are formed.

6. A model for quantifying the degree of influence of external and internal environmental threats on the control points of strategy implementation based on the hierarchy analysis method has been developed. The basis of the estimates is a model of the hierarchy of control points and threats to the organization's environment. Building the model creates the prerequisites for calculating the vectors of local priorities of control points, internal and external threats, taking into account the interrelationships of external and internal threats and control points between by itself. On the basis of local priorities, global priorities for internal and external threats to the enterprise are calculated, which are the values of the weighting factors of the impact of threats on the relevant control points. The level of global priorities determines the most likely and dangerous threats to the external and internal environments.

The results of the experiment carried out on the basis of the developed models confirm the effectiveness and reliability of the obtained scientific and methodological recommendations, the practical use of which creates prerequisites for the formation of a controlling system at enterprises as a tool for improving the efficiency of strategic management.

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ABSTRACT

Sofiichuk K. K. SCIENTIFIC AND METHODOLOGICAL SUPPORT FOR CONTROLLING IN ENTERPRISE MANAGEMENT SYSTEMS.- Manuscript.

Dissertation for the degree of Candidate of Economic Sciences in specialty 08.00.04 (Ph.D. in Economics), specialty 08.00.04 - Economics and Management of Enterprises (by type of economic activity), Kyiv, 2015.

The thesis summarizes and solves in a new way the scientific and practical task of managing an enterprise on the basis of controlling in the face of changing external and internal environment. The results of the study allowed to formulate conclusions of the conceptual and scientific-practical direction.

Modern approaches to the definition of the management category 'controlling' are classified. Today there is no more or less agreed definition of the concept of 'controlling'. In all the variety of opinions, two main approaches can be distinguished: conceptual and scientific and practical. The conceptual approach and its concept of coordination reveal the content of controlling in the most reasonable way.

The article defines the content of controlling in the context of the concept of coordination. The results of the theoretical analysis and generalization of modern research have allowed defining controlling as a separate preventive management activity, the subject of which is coordination of strategic and operational plans at the stage of their implementation, due to frequent changes in the external and internal environment in which the enterprise operates.

The system of operations and procedures of controlling technology in the process of implementing strategic plans of an enterprise is formed. Based on the essence of controlling, it is concluded that in the system of strategic management it improves and expands the function of strategic supervision or 'control of the future'. Controlling as a management activity covers a system of operations and procedures, which includes: monitoring the possible impact of external and internal threats on the control points of the strategy, their accounting, evaluation, analysis, and interpretation in order to develop reasonable recommendations to prevent the impact of the most dangerous and likely threats.

Conceptual approaches to the functioning of the controlling system have been developed, on the basis of which a corresponding model has been formed, providing for the preventive identification of threats to the organization's environment, their assessment by the degree of influence on the indicators of strategy implementation and ensuring a quick response to threats before the onset of undesirable consequences.

The mechanism for preventive identification of the most likely and dangerous external and internal threats to the implementation of the enterprise strategy based on the relevant expert model has been improved. At the first stage of the model implementation, the methodology of expert evaluation is determined, the frequency of the expert evaluation is set, the range of experts and requirements for their qualifications are appointed, the number of experts is justified, and an individual questionnaire and instructions for filling it out are formed. To conduct the expert evaluation, experts are provided with a specially prepared

database of quantitative and qualitative

values of environmental threats for the current and previous periods of strategy implementation. Experts assess the probability and danger of each threat, which allows determining its integral indicator. As a result of summarizing the experts' assessments, the average value of the integral level of importance for each threat is calculated, and its comparison with the threshold value of the indicator allows selecting the most likely and dangerous threats and forming the relevant vectors of external and internal threats. The consistency of experts' assessments was checked using the concordance coefficient.

Methodical bases for quantitative assessment of the degree of influence of external and internal environment threats on the control points of strategy implementation using the method of hierarchy analysis have been developed. The practical result of the developments is a corresponding model based on a four-level hierarchical model of the relationship between the control points of the strategy and threats to the organization's environment. Based on the threat vectors, the expert determines the elements of the respective vectors of local priorities of control points, internal threats in relation to control points, and external threats in relation to internal threats. The reliability of the expert's assessments is checked using the 'consistency ratio' indicator. Based on the local priorities, global priorities for internal and external threats to the enterprise are calculated, representing the values of the weighting factors of the threats' impact on the respective control points. The level of global priorities determines the most likely and dangerous threats to the external and internal environment.

The results of the experiment on the developed models confirmed the effectiveness and reliability of the obtained scientific and methodological recommendations, the practical use of which creates the prerequisites for the formation of a controlling system at enterprises as a tool for improving the efficiency of strategic management.

Keywords: controlling, controlling system, economic conditions, internal threats, external threats, strategy implementation process, strategic control, coordination, monitoring, management accounting, control.