

Artículo de investigación

Theoretical and methodical approaches for control introduction in the management system of industrial organization

Enfoques teóricos y metodológicos para el control introducción al sistema de gestión de la organización industrial

Abordagens teóricas e metodológicas para controle introdução ao sistema de gestão da organização industrial

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Abstract

Currently, the provision of mainly intensive economic growth in industries is of strategic importance for Russian economy, the solution of which is impossible without the increase of management process efficiency using modern tools, with a unique character including controlling systems. The aim of the study was to systematize theoretical approaches to controlling for their further application in practice. A set of scientific methods was used during the study: analysis and synthesis, system approach, comparison, abstraction, historical method, induction and deduction, generalization and formalization. The authors carried out the periodization of controlling development overseas with the identification of its evolution main stages; they systematized the basic approaches to determine the essence of controlling, which allowed to formulate the contents of its three basic concepts in accordance with evolutionary development. The reasons of various conceptual approaches existence in Russia are the incidents of the term translation, the study of controlling by the experts from different branches of knowledge, and an insufficient filling of training programs with

Resumen

En la actualidad, la provisión de crecimiento económico principalmente intensivo en industrias es de importancia estratégica para la economía rusa, cuya solución es imposible sin el aumento en la eficiencia del proceso de gestión utilizando herramientas modernas, con un carácter único que incluye sistemas de control. El objetivo del estudio fue sistematizar los enfoques teóricos para controlar su posterior aplicación en la práctica. Durante el estudio se utilizó un conjunto de métodos científicos durante el estudio: análisis y síntesis, enfoque sistémico, comparación, abstracción, método histórico, inducción y deducción, generalización y formalización. Los autores llevaron a cabo la periodización del control del desarrollo en el exterior con la identificación de sus etapas principales de evolución; sistematizaron los enfoques básicos para determinar la esencia del control, lo que permitió formular los contenidos de sus tres conceptos básicos de acuerdo con el desarrollo evolutivo. Las razones de la existencia de diversos enfoques conceptuales en Rusia son los incidentes del término traducción, el estudio del control por parte de los expertos de diferentes ramas del conocimiento, y un llenado

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controlling disciplines. The study of controlling essence made it possible to identify the totality of the tasks and the functions performed before it in interrelation and interdependence. The separation of industrial enterprise functioning features that affect the organization of management processes made it possible to conclude that it is necessary to use controlling at all stages of the operational and investment cycles, to integrate it into the management and accounting system, with the definition of a sufficient number of subjects and objects. The work has systematized the existing approaches to the classification of controlling and the author's classification, was proposed taking into account the characteristics of industrial enterprises, as well as the controlling system model that emphasizes the need to take into account external and internal factors, the introduction of controlling in the company management system. It is recommended to use theoretical and methodical research results to train experts in the field of economics and management, as well as in real practice of industrial enterprises.

Key words: controlling, an industrial enterprise management, management accounting.

insuficiente de programas de capacitación con disciplinas controladoras. El estudio de la esencia controladora permitió identificar la totalidad de las tareas y las funciones desempeñadas antes en interrelación e interdependencia. La separación de las características de funcionamiento de la empresa industrial que afectan la organización de los procesos de gestión permitió concluir que es necesario utilizar el control en todas las etapas de los ciclos operacionales y de inversión, para integrarlo en el sistema de gestión y contabilización, con la definición de un número suficiente de sujetos y objetos. El trabajo ha sistematizado los enfoques existentes para la clasificación del control y la clasificación del autor, se propuso teniendo en cuenta las características de las empresas industriales, así como el modelo de sistema de control que enfatiza la necesidad de tener en cuenta factores externos e internos, la introducción del control en el sistema de gestión de la empresa. Se recomienda utilizar los resultados de investigaciones teóricas y metódicas para capacitar a expertos en el campo de la economía y la gestión, así como en la práctica real de las empresas de la industria.

Palabras clave: control, gestión empresarial industrial, contabilidad de gestión

Resumo

Atualmente, a oferta de crescimento econômico, principalmente intensivo em indústrias, é de importância estratégica para a economia russa, cuja solução é impossível sem aumentar a eficiência do processo de gestão utilizando ferramentas modernas, com um caráter único que inclui sistemas de controle. O objetivo do estudo foi sistematizar as abordagens teóricas para controlar sua posterior aplicação na prática. Um conjunto de métodos científicos foi utilizado durante o estudo: análise e síntese, abordagem sistêmica, comparação, abstração, método histórico, indução e dedução, generalização e formalização. Os autores realizaram a periodização do controle do desenvolvimento no exterior com a identificação de seus principais estágios de evolução; Eles sistematizaram as abordagens básicas para determinar a essência do controle, o que permitiu formular o conteúdo de seus três conceitos básicos de acordo com o desenvolvimento evolucionário. As razões para a existência de várias abordagens conceituais na Rússia são os incidentes do termo tradução, o estudo do controle por especialistas de diferentes ramos do conhecimento e um preenchimento insuficiente de programas de treinamento com disciplinas controladoras. O estudo da essência controladora permitiu identificar a totalidade das tarefas e as funções desempenhadas anteriormente em interrelação e interdependência. A separação das características operacionais da empresa industrial que afetam a organização dos processos de gestão permitiu concluir que é necessário utilizar o controle em todas as etapas dos ciclos operacionais e de investimento, para integrá-lo ao sistema de gestão e contabilidade, com a definição de um número suficiente de sujeitos e objetos. Trabalho sistematizou abordagens existentes para o monitoramento de classificação e classificação do autor, foi proposto tendo em conta as características das empresas industriais, bem como o sistema de controle modelo que enfatiza a necessidade de ter em conta externa e fatores internos, a introdução do controle no sistema de gestão da empresa. Recomenda-se utilizar os resultados de investigações teóricas e metodológicas para formar especialistas no campo da economia e gestão, bem como na prática real das empresas industriais.

Palavras-chave: controle, gestão de negócios industriais, contabilidade gerencial

Introduction

At the present stage of Russian economy development, in connection with the need for survival under constantly changing conditions, the management system of an industrial enterprise can not be satisfied with old methods. Controlling, which allows to use the tools of different branches of knowledge, could contribute to the provision of management process effectiveness. However, used abroad, it was not widely used in Russian management practice, because:

- there is no consensus to understand the essence of controlling,
- controlling is associated with additional costs for its organization,
- there are no available methods of its organization at the enterprises of different sectors of economy,
- there was no clearly expressed need for its necessity.

The solution of these problems is possible in the simplest way despite their differences: by the increase of the need for controlling introduction in enterprises, which will lead to the increase of methodological development number and to the reduction of costs. At that, the first step, perhaps, is the stimulation of the need for the organization of controlling at enterprises. In order to popularize controlling at an enterprise, you need a clear understanding of its nature.

Since controlling came to us from foreign theory and practice (American and German), it is interesting that it is represented there by different positions of authors on its essence: from "the achievement of the greatest possible common result of activity" by R. Mann and E. Mayer to the system of integrated information support by D. Khan and P. Horvath (Mann & Mayer, 1992; Hahn & Labmann, 1993; Horvath, 2012). There is no common opinion in Russia too. For example, S.G. Falco and A.M. Karminsky regards controlling as the concept of system management by an organization, and V.B. Ivashkevich and M.A. Vakhrushina note "the unity of management accounting and controlling" (Karminsky, 2013; Ivashkevich, 2016; Vakhrushina, 2014). Based on the essence, the tasks, the principles, and the functions are defined underlying the controlling system at a

particular enterprise, especially at the industrial one, since industry is the economy locomotive, it has a larger composition of economic processes in comparison with trade. Therefore, the article is aimed at the systematization of theoretical approaches to controlling for their further application in practice.

Methods

The basis of the research was the use of predominantly theoretical scientific methods, including:

- analysis and synthesis, system approach, comparison - in the classification and the generalization of the basic approaches to the definition of controlling and its typologization;
- abstraction - during the determination of controlling essence from the standpoint of different authors and identification of the main features inherent in controlling, its goals, objectives and performed functions;
- historical method - during the analysis of "controlling" concept evolution;
- induction and deduction, generalization and formalization during the construction of their own conclusions.

Results of the study

It is widely believed that controlling abroad has evolved evolutionary in economic literature. The authors distinguish many stages, dividing them according to different classification criteria to support this or that idea (Karminsky, 2013; Ivashkevich, 2016; Vakhrushina, 2014; Kalinina, 2015; Losbichler, 2012). In our opinion, it is necessary to classify the development of controlling in accordance with the types of markets, as it provides the development of an enterprise management system depending on the manifestations of environmental factors, first of all, and then proceeding from internal opportunities (internal factors). Besides, this classification is simple and logical. It is enough to distinguish only three stages:

Stage I - until the 30-ies of the last century - the servicing of the seller's market, characterized by a relative stability and the growth opportunities for the industry. At this stage, controlling is identical to management accounting and is

designed to generate information for making managerial decisions.

Stage 2 - from the 30-ies to the 80-ies of the last century - the servicing of the buyer's market - there is an increased supply of goods, and, consequently, an increased competition. There is a need to improve the efficiency of resource use, controlling is used for budgeting and control.

The third stage - from the 90-ies of the last century - the globalization of the economy - the servicing of the investor's market - the concern for company value increase. At that controlling is the system of "management by management"

(Losbichler, 2012). The control over the work of managers to avoid their mistakes.

In Russia, controlling has "come" with perestroika and it can be said that the stages of evolution are not traceable as such. All knowledge came at the same time, but were mastered on different grounds. And, therefore, in Russia controlling is associated with management accounting, and with internal control, and with planning, and with management.

The study of controlling administrative essence in foreign and domestic practice made it possible to systematize its various concepts in accordance with the stages of evolution (Figure 1).

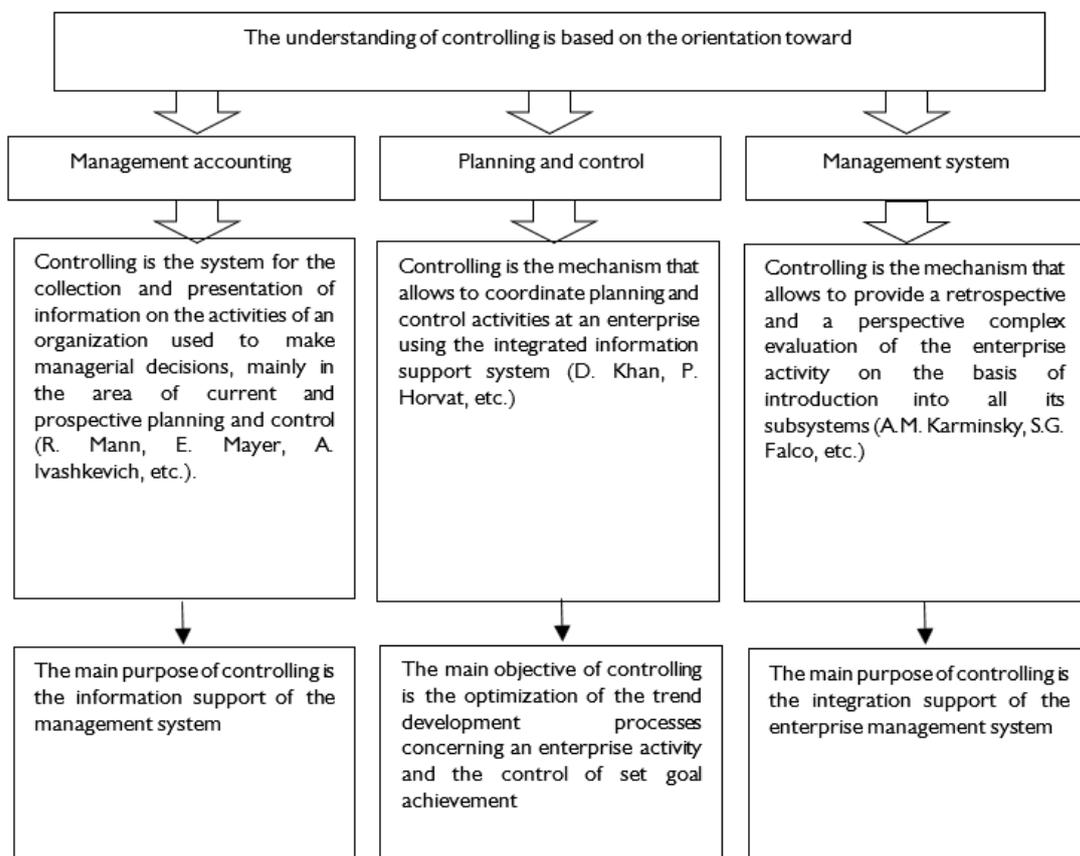


Figure 1 – The scheme of controlling concept systematization

The absence of a unified approach to the essence of controlling and a single concept is explained by a number of reasons:

- incidental translations of the term itself,
- the research of controlling by the experts of different branches of knowledge,
- inadequate filling of the training programs by this discipline.

An ambiguity in understanding the essence of controlling is explained, first of all, by the incidents of the term translation. So, for example, when you translate from Russian into German, controlling and management accounting are referred to as "Controlling". In English, controlling is translated as "Business planning and control", and management

accounting is translated as "Management accounting (cost accounting)". That is, judging by the translation, controlling and management accounting are different concepts. And in the English version, planning is added.

Theoretical generalization of controlling in Russia was carried out by the researchers of different branches of knowledge.

Scientific studies of management accounting and controlling in Russia are dictated by the passport of VAK specialties [9]: 08.00.12 - subpar. 1.7 (Accounting (financial, managerial, tax, etc.) accounting in the organizations of various organizational and legal forms, all spheres and branches), 1.8 Specific features of accounting (financial, managerial, tax, etc.) reporting by industry, territories and other segments of economic activity") - on management accounting and reporting and 08.00.05 - par. 1.1.26 ("Theoretical and methodological approaches to the creation of a controlling system in an industrial organization") - on controlling. Therefore, scientific research in the framework of candidate and doctoral dissertations was conducted in two areas: management accounting and management (management, controlling).

The absence of a unified approach in theory and practice is conditioned, inter alia, to the training programs for controlling and management accounting.

The development of controlling concept in Russian Federation, the degree of understanding and this tool application is directly influenced by the process of future expert training in the field of economics, management and finance.

The analysis of the curricula of more than 50 universities has shown that the interest in controlling has increased recently. This is reflected in the emergence of master programs and advanced training programs "Management Accounting and Controlling" in some universities, for example:

- Financial Academy under Russian Federation Government, field of expertise 38.04.01

"Economics";

- Kazan (Volga region) federal university, field of expertise 38.04.01 "Economy";

- Voronezh State Agrarian University named after the Emperor Peter I, field of expertise 38.04.01 "Economy";

- St. Petersburg State Economic University, an advanced training program (80 hours).

If there is an appropriate profile of training at a university, various aspects of controlling are studied, usually a curriculum has the disciplines devoted to its current concepts, operational and strategic controlling and budgeting in the controlling system.

A number of universities has only separate related to controlling disciplines in the curriculum for the preparation of masters. For example, in the Russian Academy of National Economy and Public Administration the master programs in the field of expertise 38.04.04 "State and municipal management" the discipline "Management accounting and controlling in state and municipal organizations" is studied. In the Tyumen State University and the Pacific ocean State University they study the discipline "Financial Controlling" in the field of expertise 38.04.08 "Finance and Credit".

As for the preparation of bachelors, the discipline "Controlling" is found only in 4% of cases in their curricula.

This state of affairs indicates that the bulk of economics professors with bachelor degrees trained by domestic universities have almost no idea about controlling and its capabilities, and therefore can not use this tool in their professional activities. Among those who receive the second level of higher education, there are the potential experts who understand the advantages of controlling and who are interested in its implementation and use.

Despite different emphases, controlling performs a certain set of functions and tasks that correspond to its concepts (Figure 2).

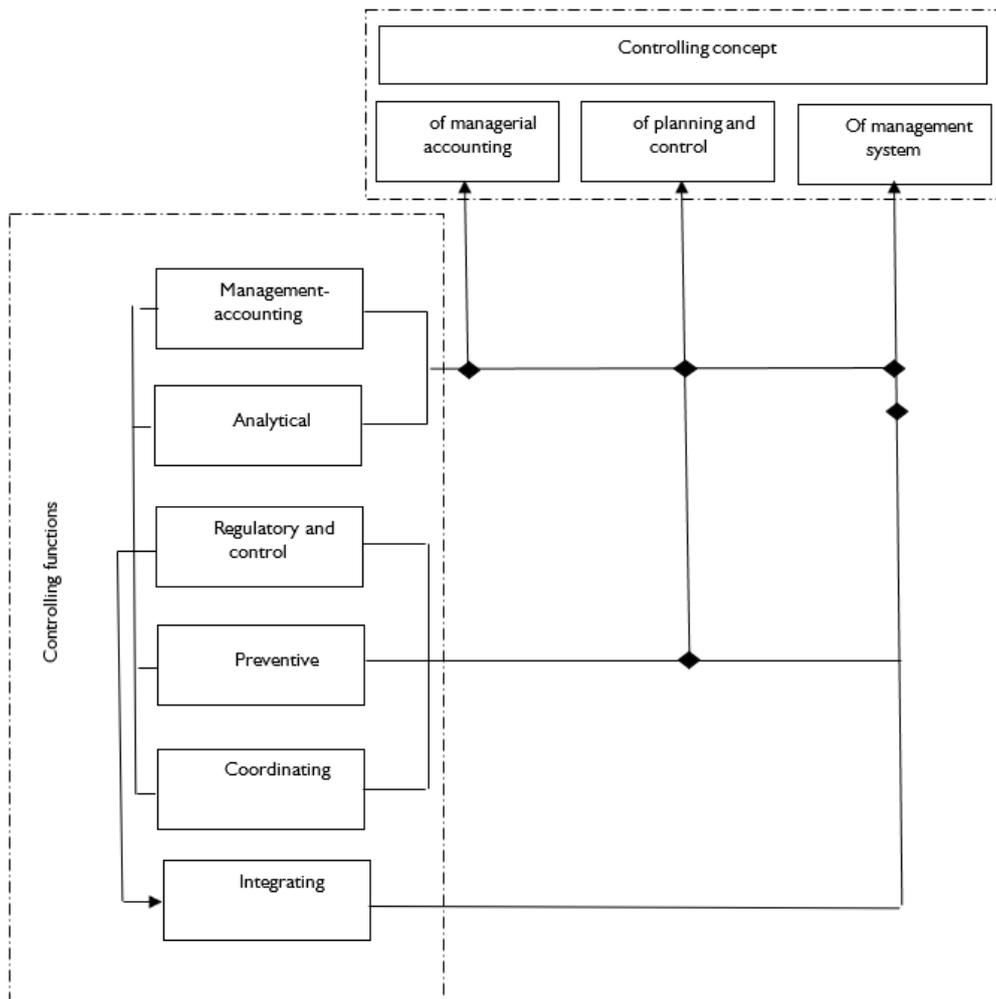


Figure 2 – The scheme of controlling function correspondence to its concepts

In accordance with the functions, controlling performs certain tasks. In accordance with the accounting and management function, the task is to form and process the necessary information on the economic activities of enterprise responsibility centers for making managerial decisions. Analytical - involves the assessment of information about the economic activities of enterprise responsibility centers for managerial decision making. Both these functions correspond to the concept of controlling as management accounting.

The regulatory and control function involves the following tasks: the development of norms and standards according to controlled costs and revenues, the determination of acceptable limits of deviations by costs and revenues, the comparison of actual and regulatory values by

controlled costs and revenues. Preventive - involves the determination of deviation causes concerning the actual values of the monitored indicators from the selected reference database; the identification of monitored indicator value deviation trends from the planned values and a timely provision of this information to an enterprise management. Coordinating - the coordination of operational and strategic objectives of an enterprise activity through a system of monitored indicators. The regulatory and control, coordinating and integrating functions are consistent with the concept of planning and control.

Integrating involves the integration of strategic and operational management, the process of planning, control, analysis and regulation in a single system. This function corresponds to the

control system concept. According to A.M. Karminsky and S.G. Falco this function describes the attitude towards controlling in Russia (Karminsky, 2013). Without contesting this opinion, let's note that the application of this or that concept of controlling in Russia depends on various external and internal factors: industry affiliation, the needs and opportunities of enterprises to use it: if there are less opportunities, then the first evolutionary concept is applied and by analogy (Vorozhbit & Levkina, 2017; Terentyeva et al, 2017; Osipov et al, 2017).

The belonging of an enterprise to this or that branch of the economy is the basic one. Each sphere of economic activity has its own specifics, which is expressed in the features of managerial process organization, including controlling processes. As for industrial enterprises, they are characterized by the following main specific features.

1. The rotation of working capital in industry includes all stages (money - money resources of an enterprise, production - production stocks, the production in progress, goods - shipped goods, finished goods at a warehouse). Therefore, it becomes necessary to monitor cash and material assets on an ongoing basis and in terms of the maximum possible number of indicators. In contrast, for example, from trade, in which the production stage is absent.
2. The development and the production of products takes a long period of time (there is also a significant gradation between different industries).
3. Industrial enterprises usually have an extensive organizational and financial structure, which directly affects the management system.
4. The processes of production and management accounting are characterized by a high degree of complexity.
5. The investments in production development, the creation of new types of products are an integral part of an industrial enterprise activities. There is the link not only between the indicators of activity profitability and the return on investment, but also the relationship between the profitability of specific types of products and the return on specific investments.

These features determine the need of controlling application at all stages of the operational and investment cycles, its integration into the management and accounting system with the

determination of a sufficient number of subjects and objects. That is, the most appropriate for industrial organizations is the use of controlling concept as a management system (or integrated). However, at the first stages of its implementation in the practice of industrial organizations one can begin with the management accounting or with planning and control, subsequently synthesizing them into the management system (Konvisarova & Hwan, 2017; Sidorenko & Frolova, 2015; Suglobov & Podrezov, 2015).

It is necessary to orientate in its varieties for direct application of controlling in industrial organizations, therefore it is required to classify its numerous species according to certain characteristics.

In economic literature different classifications of controlling are presented (Ivashkevich, 2016; Kalinina, 2015; Fried, 2017). The most common reason for controlling types distinguishing is its purposefulness. According to this approach, most domestic and foreign scientists distinguish between strategic and operational controlling, individual experts add tactical and dispositive controlling to these types (Yakovleva, 2011). Using the integration approach, economists share controlling within the functional areas of management: production, marketing, innovation, investment, financial, personnel, quality controlling (Ivashkevich, 2016; Kalinina, 2015). The identification of controlling types in the context of certain areas of activity is close by the meaning to the functional classification: logistics controlling, the controlling of resource provision, the controlling of investment and innovation, the controlling of personnel, etc (Sharman & Shepherd, 2017). The most detailed classification of controlling is represented by N.M. Kalinina, in her understanding, controlling is the mechanism integrated into the company management system (Kalinina, 2015).

The systematization of existing approaches to the classification of controlling, as well as the consideration of industrial enterprise peculiarity functioning, allowed the authors to propose six grounds for classification and the corresponding types of controlling, which are presented in Table I.

Table 1 - Classification of controlling for an industrial enterprise

Grounds for classification	Controlling type	Essence
Enterprise management purpose	Strategic controlling	Provides enterprise management with information necessary for the development of a strategy and the determination of a company long-term development goals.
	Tactical controlling	It provides the management of an enterprise with the information necessary for decision making on the choice of means by which the set goals must be achieved.
	Operational controlling	Details the information generated during the implementation of tactical control.
	Dispositive controlling	It presupposes the organization of unplanned events to advance a company to the goals set if the planned indicators are not achieved.
	Production controlling	It presupposes the creation of an information base, in accordance with the data on the volume, the pace and the structure of production at an enterprise, the production capacity, the likely trends of productivity level change and the stages of preparation for the production process. This information is used to make decisions in the field of production organization.
Functional areas of management	Resource provision controlling	It provides an enterprise management with the information necessary to make decisions to determine the rational flows of material resources, their integration into other business processes.
	Sales controlling	It presupposes the creation of an information base on the volume and the structure of marketing activities, which allows to make effective management decisions in the relevant field.
	Financial controlling	It provides the management of an enterprise with the information necessary to make decisions in the sphere of company financial management.
	Personnel controlling	It provides the management of an enterprise with the information necessary to make decisions in the field of personnel management.
	Techno-technological controlling	It provides the management of an enterprise with the information necessary to make decisions regarding the possibility of technical and technological innovation, R&D, intellectual property rights, and so on.
	Investment controlling	It provides the management of an enterprise with the information necessary to make decisions regarding the implementation of investment projects.
	Environmental controlling	It provides the management of an enterprise with the information necessary to make decisions to ensure environmentally friendly operations of the company.
Management level	Lowest level controlling	A complex of separate procedures for planning, accounting, control, analysis and regulation, with the focus on the level of low level manager competence.
	Average level controlling	A complex of separate procedures for planning, accounting, control, analysis and regulation, with the focus on the level of middle rank manager competence.
	Top-level controlling	A complex of separate procedures for planning, accounting, control, analysis and regulation, with the focus on the level of senior manager competence.
Current financial condition of an enterprise	Preventive controlling	It provides an enterprise management with the information necessary to make decisions in a stable financial condition and favorable environmental conditions.
	Stabilizing controlling	It provides the management with the information necessary for decision-making under unsustainable financial condition and unfavorable environmental conditions.
	Anti-crisis controlling	It provides the management of an enterprise with the information necessary for decision making in a crisis financial condition.
The time interval required to	Short-term	Controlling procedures carried out for 1-3 years.
	Medium-term	Controlling procedures carried out for 3-5 years.
	Long-term	Controlling procedures carried out for more than 5 years.

achieve the specified results		
Frequency	Active controlling	Characterized by a continuous control process to ensure the achievement of enterprise objectives.
	Passive controlling	Characterized by periodic actions of experts or managers on the analysis of current information about the functioning of an enterprise production and management system.

The use of the proposed classification is recommended in the process of preparation for the controlling system introduction to select an acceptable concept, as well as in the training of experts.

Different approaches to the essence of controlling, functions and tasks, the classifications of species and other aspects of its methodology demonstrate the interest of the scientific community in this research object and confirm that controlling is a flexible management system that is able to meet a variety of internal and external conditions and a development trend chosen by management" (Osipov et al,2017).

Discussion of results

After the analysis of the basic conceptual approaches to controlling essence determination, having highlighted its goals and objectives, the main types and their content, as well as the specifics of controlling process organization in an industrial enterprise, we face the need for the practical use of obtained results, which is equivalent to a controlling system model development. The model developed by the authors is shown on Figure 3.

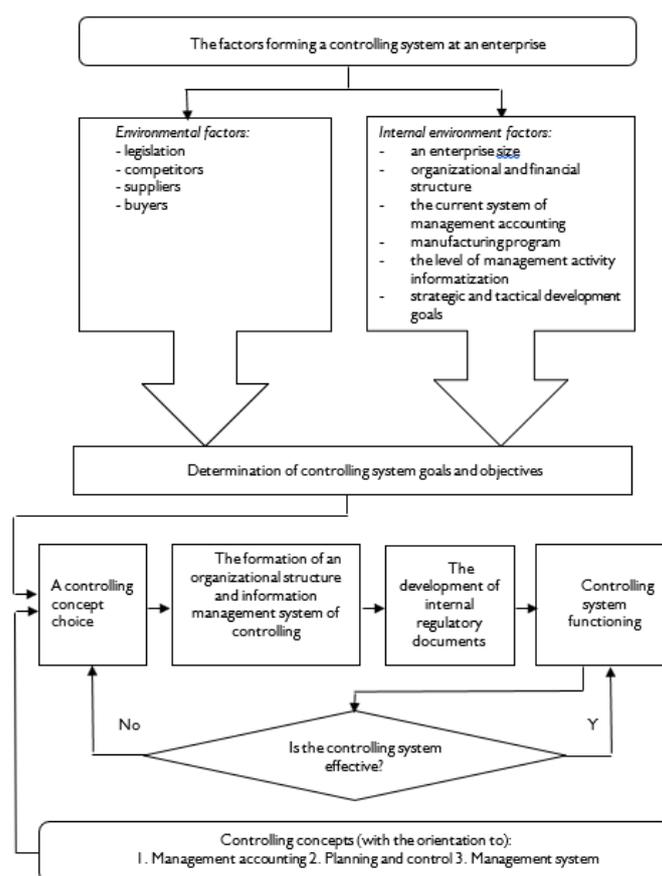


Figure 3 – Controlling system model at an industrial enterprise

In order to develop an effective controlling system at an industrial enterprise, it is necessary to proceed from the following prerequisites:

1. During the development and the implementation of controlling in the management system, it is necessary to take into account the factors of external and internal environment. At the same time, environmental factors are the determining ones, and the factors of the internal environment characterize the specific features of a particular enterprise.
2. The analysis of the abovementioned factors, including strategic and tactical development goals of a company, allows us to formulate the goals and the objectives of the controlling system (Brovko & Petruk, 2016).
3. The development of a controlling system is impossible without the knowledge of its basic concept essence.

Having chosen this or that concept of controlling, the managers of the company must take a number of organizational steps:

1. To create an organizational structure and a system of information support for controlling (including IT-technologies). (Petruk & Lutsenko, 2016).
 2. To develop a system of internal documents regulating controlling processes.
- Only after this it becomes possible to introduce a controlling system into the existing enterprise management system. However, the controlling system, like any other management mechanism, needs constant analysis of positive impact on company operations. If there is a positive effect, it continues to function without changes; if there is no positive effect, corrective measures are needed: the revision of a chosen concept, organizational changes.

Summary

Thus, in the course of the study, the following results were obtained:

1. A simple authorial classification was proposed concerning the stages of controlling overseas evolution by market types, which differs from existing ones.
2. The systematization of controlling concepts was performed in accordance with the stages of its evolution in the author's understanding.
3. They determined and systematized the reasons for the absence of a unified approach to controlling essence, and the necessity of its theoretical generalization was substantiated.

4. The functions and the tasks of controlling were synchronized in accordance with its concepts.
5. Based on the identified specific features of the industry, the necessity to apply the concept of controlling as a management system was substantiated, that is, the integrated type controlling. At the same time, it is permissible to begin with the management accounting or planning at the first stages of its implementation into the practice of industrial organizations, subsequently integrating them into the management system.
6. The author's classification of controlling kinds was proposed on the basis of existing approaches and the features of industrial organization functioning systematization.
7. They developed a controlling system model at an industrial enterprise, they indicated the sequence of steps for its implementation and functioning.
8. The proposed theoretical generalizations are recommended for use in the training of economic experts, as well as in the management practice of industrial organizations.

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