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## Methodology of Financial Research by Stages of Innovation Process

**Abstract.** The article deals with issues related to the peculiarities of the methodology of conducting financial research at the stages of innovation process. Important in the author's approach is the formulation of the problem of forming a certain set of research methods for the stages of innovation process from the standpoint of financial results. The following methods were used in the research: dialectical method and methods of analysis and synthesis, methods of comparison and generalisations, structural and logical analysis. To achieve the set goal, namely, to determine the composition of research methods of innovation process by stages, each of which has its own specificity and may require a unique set of methods, a comparative analysis of interrelated research objects, which are the innovation process, the life cycle of the product (products, services, objects) and scientific and technical preparation of production. For the studied object – the innovation process – an analysis was made and two main research subjects, certain stages of the innovation process, were distinguished: fundamental and applied research. Complexes of research methods were formed for each of them for the first time in order to determine financial goals and objectives. It is proposed to consider the determination of the maximum amount of budget expenditures for the implementation of innovative processes as a financial goal of the research of objects of fundamental and applied research. A matrix of complexes of research methods for the stages of the innovation process with expected tasks and results of financial activity was formed. The conclusions obtained as a result of the research can be useful in practices of employees of research institutions and organisations, graduate students and students of higher educational institutions researching the problems of innovative development and implementing the stages of the innovation process

**Keywords:** research methods of the stages of innovation process, product life cycle, scientific and technical preparation of production, financial goals of research, questions of financial activity research

### INTRODUCTION

Methodology is important for any activity. After all, it is the methodology that determines the course of the process and ultimately the result of the activity. The methodology is mentioned mainly in connection with the implementation of certain studies, as research activities require the definition of the necessary set of methods. From the chosen set of research methods depends not only the content and outcome of the process of studying a problem. The set of methods affects the composition of the research team, which can be sufficiently qualified from the standpoint of problem statement, its differentiation into research components, as well as competency to make responsible decisions

for the content and sequence of research adjustment. Thus, the methodology through a number of factors of objective and subjective nature affects the research process, its objectivity and impartiality, the final result of the study.

Recently, methodological issues are largely covered in the educational literature. The search showed a small number of publications on methodology in periodicals devoted to current pressing issues of socio-economic activity [1-3]. To some extent, classical works have exhausted the problematic issues of purely methodological research [4; 5]. Finding new common ground between methodological research is not attractive at this time, given the desire of researchers to

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work on topics that focus more on practical issues that allow them to apply for grants from corporations. Fundamental research of a theoretical nature is inferior to applied research.

Instead, attention to methodological issues should be continuous. Only from methodological principles it is possible to correctly assess the situation in business, in the financial condition of territorial communities, in the budget sphere. Research on financial relations of economic entities in the financial and credit, tax spheres should be based on well-developed, sound methods. Changes in the development of the economy, its focus on innovative projects and programs pose new challenges for researchers. In turn, researchers set scientists the task of developing effective methods of research. This means the need to turn to the principles of methodology, to new searches for such sets of already known research methods that will best meet modern demands.

One such request is financial research of the stages of the innovation process. The fact is that there have been significant changes in the economy and society recently. At the same time, these changes are global in nature and have a significant impact on the economies of all regions: Asia, Africa, North and South America, Europe and, of course, Ukraine.

Implementing a number of reforms in Ukraine, including administrative-territorial [6-8], now requires a different approach to regional finance. The finances of local communities completely depend on the success of business structures located on their territory and fill the budget with their taxes. Thus, the efficiency of enterprises to some extent depends on the right actions to sell products, and this is influenced by innovation. Achieving a positive result requires appropriate new technologies, new product designs, compliance with not only economic but also environmental requirements. Everything affects the success, the achievement of which is possible with well-constructed research, taking into account the desired and expected financial results. This requires an appropriate methodological framework for financial research of innovation processes.

Quite a number of publications have been devoted to the study of methodology problems. Mostly researchers consider these problems from a philosophical, general scientific point of view. Thus, scientists N.J. Dewasiri et al. [1] conducted a study that reveals the rationale and types of projects for the application of mixed methods approaches in financial research using the approach of systematic review of the literature. J.F. Molina-Azorin et al. [9] describe the possibilities and problems of research of mixed methods in organisational sciences. There are also publications on certain aspects of methodology, in which the authors consider certain subject areas, or special research methods. In particular, researchers S. Galletta et al. [2] focus on bibliometric analysis in the context of ESG performance identification in the banking industry. Y.L. Becker & M.R. Reinganum investigate quantitative equity investing and methodology for assessing its current condition [3].

The research of C. Hampshire [10] is also interesting. The aim of his study is to examine the understanding of

consumers from the UK on building trust and potential risks of mobile payments using several mixed methods.

Identifying the methodological basis is also deeply studied by scientists in the context of studying the patterns of the process of sustainable transformation. For example, the aim of the study of L. Chithambo & V. Tauringana [11] is to identify the influence of corporate governance mechanisms (board size, non-executive directors, concentration of ownership and shareholder action) on the level of greenhouse gases (GHG).

Instead, regarding the methodology of financial research, it should be noted a limited number of such works [12; 13]. And the number of works regarding the methodology of financial research of certain subject areas is still very small. In particular, there are no studies of such a subject area as “stages of the innovation process”.

Researching the field of innovative development of enterprises, scientists focus more on the concepts of innovation and applied aspects of innovation [14; 15]. Instead, it is important to study the methodological fundamentals of the formation of processes, particularly in the study of innovation.

*The purpose of the article* is to identify the peculiarities of the methodology of financial research at the stages of the innovation process, outline the composition of research methods of the innovation process by stages.

## MATERIALS AND METHODS

The methodological approach is determined, to a large extent, by the purpose of the study. Thus, the purpose of our study is to identify the composition of research methods of the innovation process by stages, since each of the stages has its own specificity and may require an original set of methods.

Achieving the set goal requires consistent consideration, at least conceptually, of the composition and features of the stages of the innovation process. The sequence and composition of the stages of the innovation process are well known and recognized. Instead, there are alternative views on this issue, which requires us to note in our study what stages we are considering. Regarding the characteristics of these stages, this aspect of our study is extremely important, because such characteristics are the basis for choosing research methods for each stage. It should be emphasised that the research methods of each stage of the innovation process are aimed at obtaining answers from a financial point of view. This is important for investors, for creditors, for business owners who are borrowers of financial resources and guarantors of their return, payback, high level of profitability.

It is important to make a clear distinction from the outset between innovation process (IP) research and research of the life cycle of the product (goods, services, object – enterprise) (LCP) and scientific and technical preparation of production (STPP) as objects of scientific financial research.

This distinction is intended to clearly define the objectives for each of these objects. It is also worth noting that we take the stages of the innovation process as the subject of our research. These are the ascending axioms of our study.

The methodological and source base of the study are domestic norms and legislation on the peculiarities of the transformation of the financial sector in Ukraine [6; 7], the implementation of reforms at the state and regional levels [8]. The research materials are also based on identification of general scientific research methods, as well as the separation of research methodology in specific areas of economics in order to identify opportunities for the development of research methods in terms of financial relations. The criterion for selecting information for the study of research methods in finance was to determine the research methodology of innovation process with the aim of forming a methodological base in view of the need for financial support for R&D.

During the research the following methods were used: dialectical method and methods of analysis and synthesis – to study the peculiarities of identifying financial goals and objectives by objects and corresponding subjects of financial research; comparison and generalisation methods – analysis of the use of research methods at different stages of innovation process in the relevant applied fields; structural and logical analysis – forming the complexes of research methods of innovation process stages with the supposed tasks and results of financial activity.

## RESULTS AND DISCUSSION

The research methodology involves defining the problem and the order of its study, dividing the problem into constituent issues and substantiating the methods of solving problems and, as a final desired result, solving the problem in general. In our study, such a sequence means, first, the innovation process studying according to the known division into stages. It is worth paying attention to the differences between IP as an object of study from such objects as LCP and STPP. Secondly, the need to outline the key features of each stage of the innovation process that directly influences the choice of research methods. Third, determining the composition of research methods for each stage of the innovation process.

So, as for the problem itself, it is determined based on the needs of practical activities. The problem is usually formulated by practitioners based on work experience and the need to solve specific tasks. In the theory of innovation, this approach is called the “demand pull” hypothesis. Another approach – the hypothesis of “technological push” is based on the logic of science, on the autonomy of this development [4; 5]. Therefore, quite often theorists formulate the problem based on a sequence of logical or mathematical dependencies, and even intuitively. The formulation of the problem “methodology of financial research at the stages of the innovation

process” is caused by research needs in the field of innovation development. However, there are also practical needs to address these issues. They are determined by the problems of sustainable development, circular economy in the context of accelerated implementation of innovative projects, products, restructuring of enterprises and entire industries. This requires a meticulous and sufficiently qualified assessment of financial needs and associated risks, as noted by the authors of publications [16; 17]. Research on innovation processes in terms of sustainable development and transformation now constitute a whole new layer of research [18; 19], as they highlight the principles of scientific and technical work in the context of ensuring the transition of countries to the principles of sustainable development [20-22]. The works of scientists are devoted to this issue [23-25].

There is no need to search for special approaches or methods to divide the selected problem into constituent parts in the context of study as the stages of the innovation process are generally recognised [26; 27]. However, the need for clarifying the difference between the objects of research: “innovation process”, “LCP” and “STPP” remains unresolved. Consider their differences as objects of financial research.

Proper identification of the object and subject of research is an important aspect of financial research. From these perspectives, current review of financial research methodology requires the separation of these objects from each other. Innovation process, product life cycle (goods, services, object, including innovation), and scientific and technical preparation of production have their components, structures, cyclical implementation.

In the context of research, an important step in considering the product life cycle was the publication of N. Kurgan and J. Volkovska on the calculation of the cost of a new type of product by stages of the life cycle in the system of management accounting [13]. From a methodological point of view, it is important to identify research questions and try to solve the problem of estimating the cost of work at each stage of the product life cycle. We do not set the task of considering the cost of estimating the stages of LCP. From the standpoint of study, the emergence of scientific and practical work is important, the purpose of which is to assess the value of each stage in multi-stage processes. After all, study is also devoted to the attempt to form certain sets of methods for evaluating certain stages of the multi-stage innovation process.

Scientific and technical preparation of production (STPP) is sufficiently researched and includes generally accepted components: scientific preparation, economic preparation, design and technological preparation, organisational preparation.

The study of the components of each of the objects is the study of certain objects, smaller in content than the object. Each object and each subject of research has its own purpose and/or task. This methodological approach can be represented in Table 1.

**Table 1.** Financial goals and objectives by objects and corresponding subjects of financial research

Objects of basic and applied research	Subjects of basic and applied research	Financial objectives of basic and applied research	Goals of financial research in basic and applied research
<b>Innovation process (IP)</b>	Basic research; Applied research; Experimental production; Testing of prototypes; Initial serial production; Diffusion (spread)	Determining the maximum amount of budget expenditures for the implementation of IP	Determining the amount of expenditures from state programs for the development of the national economy at individual stages of IP
<b>Product life cycle (LCP)</b>	Development; Introduction stage; Growth stage; Maturity stage or sustainable production (use) of the product; Decline of consumption (use) and production of the product; Product disposal	Determining the deadline for product production in order to avoid losses and bankruptcy	Determining the amount of costs for individual stages of LCP and comparing their total value with potential income before the decline
<b>Scientific and technical preparation of production (STPP)</b>	Scientific preparation; Economic preparation; Design and technological preparation; Organisational preparation	Determining the maximum cost of STPP	Determining the amount of costs for individual stages of STPP

**Source:** own research

It is common knowledge that the innovation process includes the process of scientific and technical preparation of production with the following stages of innovation, and at the end of the product life cycle (product, service, object) stage of utilisation of tangible elements of technology used.

Scientific and technical preparation is a process that is implemented directly at the enterprise. The services of the enterprise are carried out either independently or through outsourcing, on a cooperative basis with other enterprises and organisations, the processes of scientific and design and technological preparation of production. Regarding economic and organisational preparation, the company's services must independently assess and plan all stages of STPP, including assessing the necessary financial resources for outsourcing.

The product life cycle is of great importance for understanding the prospects of production of goods, provision of services, establishment of the enterprise. Therefore, the marketing department of the company must forecast the appropriate periods of growth and sustainable production to obtain maximum revenue from the sale of each product. Timely determination of the moment of the beginning of decline should help to avoid unprofitability of production of a separate product and to prevent bankruptcy of the enterprise. These requirements determine the deadline for the production of specific products in diversified enterprises.

The innovation process is quite broad and we should not talk only about the level of the enterprise. The innovation process covers enterprises of a certain type of economic activity – industry, and therefore at the same time affects the economy of the region and the state and is influenced

by regional and state authorities and management. In particular, basic and applied research have such an affect. After all, even world-class corporations often use the financial resources of the state and relevant powerful research institutions to obtain the necessary scientific results for innovative development. This explains why budget funding is important for the innovation process implementating. At the same time, depending on the priorities, financial resources can be attracted from state or local budgets. However, as our previous research on this issue shows, it is unlikely that such funding from a single local community will be directed. Rather, this applies to the regional budget.

We directly study the innovation process. Taknig into account the importance of budget funding, only a comprehensive approach to studying the preconditions for this process will allow one to choose the right version of state economic policy for a particular type of economic activity. The best option of economic policy is the basis of effective production, implementation of the production process, and then its termination and utilisation of technological means, which will contribute to economic efficiency at all stages of the life cycle, both products and enterprises. Only a comprehensive analysis, study of the features of each stage will allow to obtain the right, economically and environmentally sound technical and organisational solutions that will meet the principles of the circular economy and sustainable development in the region and country.

From the point of view of investors, the financial aspects of the innovation process are important. It is clear that the sale of products or services should bring the appropriate financial result. As a rule, the answer to the question

of the feasibility of production and sale of products (services) is given by marketing research. They relate to the consumer needs of individual markets, the volume of production of certain modifications of goods, the peculiarities of service provision and many other aspects. Comparing the potential results of future sales with the costs of preparation and implementation of the production process provides answers to questions about the effectiveness of investing, investing in a particular innovation project.

Instead, the evaluation of individual stages of the innovation process remains an important issue. After all, investing begins with basic research, continues with applied research, research production, testing of prototypes, which requires a long period and significant funds. For example, the requirement of clinical trials, pharmaceutical industry is characterised as complex, time-consuming and financially costly. It is also necessary to emphasise the need in a number of cases of parallel development of technologies of basic processes and research of technological processes of future utilisation of used products, materials, structural elements of technological equipment and facilities. An example of this is nuclear power, which has not yet developed effective and safe methods of decommissioning facilities that have expired.

This requires the choice of certain research methods that will most adequately reflect the specifics of each stage of the innovation process. Of course, the choice of research methods should be based on sound typology. In turn, the typology must be determined by objective criteria. And objectivity itself must follow from scientifically sound logic.

Let's start by defining the criteria that should serve as a typology of research methods. The logical method for determining these criteria allows us to formulate two criteria. The first criterion is the adequacy of the group's reflection of research methods of a particular activity, including the above mentioned components, namely: basic and applied research, experimental development (experimental production and testing of prototypes), initial mass production, diffusion (distribution). Analysis of the nature of these components of the innovation process for the choice of methods for their study allows us to conclude about some technological similarities between experimental and initial mass production. To some extent, these productions repeat the versions of applied research, where they develop, improve and test technological techniques and processes. Thus, we conclude about the possibility of the application of the same set of research methods for applied research, experimental production and testing of prototypes (experimental developments), as well as the initial serial production.

Diffusion can be considered somewhat separately. If we consider this process in terms of the transfer of waste technology to a network of corporate enterprises (including those located in different countries), the main issue will be the feasibility of scaling production. In other words, the efficiency from the point of view of the producer of more

products with reference to specific climatic conditions, aesthetic and cultural preferences of the population of a particular region. And in the case of manufacturing the means of production features not only the use of equipment, but also the environmental consequences of technology, their compliance with local standards and requirements. It is clear that marketing methods should be used to assess this situation.

The second criterion is compliance with the financial goals and objectives of the research objects of basic and applied research. Above we have substantiated and selected for such purposes the determination of the maximum amount of budget expenditures for the innovation process implementing and the determination of expenditures on state programs for the development of the national economy at individual stages of this development.

Approaches have already been developed concerning the classification of sets of research methods for the needs of current financial research, based on the division of research into prospective and current, identified different areas of these types of research [12]. Using the matrix approach developed, will form the features of the typology for the the stages of the innovation process financial studying. To this end, will consider each stage in terms of the possibility and feasibility of using specific research methods.

Studying the stage of fundamental research from the point of view of funding should be based primarily on the logic of the development of a particular scientific field. Almost all possible methods should be used for this purpose. Theoretical methods are the basis of fundamental research, as they allow to formulate the axioms, hypotheses necessary for scientific activity, to make generalisations based on the results of systems analysis. Empirical methods are important from the standpoint of obtaining experimental data and the ability to further model both production and financial and economic processes. The combination of these methods will determine the directions of development and shape public policy on certain types of economic activity. On the basis of the received estimations it becomes possible to define schemes of financing of scientific activity.

Empirical methods of observation and description are important at the stages of applied research, experimental production and testing of prototypes, which allow further use of theoretical methods of generalisation and systems analysis, as well as general methods of analysis and analogy. This set of methods may allow the results of applied research to draw a conclusion about the potential effectiveness of the developed innovation in comparison with analogues of other manufacturers. Of course, it is possible to compare, provided that the information required for comparison is available in the conditions of careful protection of trade secrets by each of the competitors.

The typology of research methods of stages of the innovation process with the expected tasks and results of financial activities are shown in Table 2.

**Table 2.** Matrix of forming the complexes of research methods of innovation process stages with the supposed tasks and results of financial activity

Group of methods	Research methods	Compliance of research methods							
		1	2	3	4	5	6	7	
Empirical methods	Observations								
	Description								
	Comparison								
	Experiment								
	Modeling								
Theoretical methods	Axiomatic							Basic research and, as a result, determining the state policy on a particular type of economic activity and funding schemes for scientific activities	
	Hypothetical								
	Generalisations	Applied research, research production and testing of prototypes and, as a result, the opportunity to draw conclusions about the financial potential of innovation and the possibility and feasibility of financing innovation development from state or regional programs							
	System analysis								
Theoretical general logical methods	Analysis	Applied research, research production and testing of prototypes and, as a result, the opportunity to draw conclusions about the financial potential of innovation and the possibility and feasibility of financing innovation development from state or regional programs							
	Analogy								

Source: own research

The study of publications on methodological topics, which was conducted from the standpoint of the stages of the innovation process, revealed certain “white spots” on methodological approaches. It was found, in particular, that the publications on methodology are mostly contained in the educational literature and relate mainly to general issues of a classical nature. That is, well-known interpretations of the composition, characteristics and examples of the usage of research methods are presented. Instead, there is little research that would reveal the peculiarities of the use of research methods in certain subject areas.

This situation, in our opinion, can be explained by the following circumstances. First, methodological issues, apparently, continue to be dealt with by specialists in the field of philosophy, who do not have deep enough knowledge in other areas of human activity. Secondly, at the same time, specialists from different fields of economic activity do not undertake research on methodology in their subject areas, relying entirely on the already known postulates of philosophical science. These two conclusions also apply to financial science, where methodological problems in a special sense are practically not considered. Third, complex socio-economic processes require researchers to have significant in-depth knowledge of both the subject area and the relevant methodological framework. However, there have been studies of such a complex process as the product life cycle, where the authors have studied the calculation of costs at certain stages of LCP. This is a significant step both in the practical direction to solve the problem of compiling the cost of individual works, and in the direction of the very formulation of the problem of research and cost estimation of the stages of LCP.

### CONCLUSIONS

Research on the innovation process which is also complex, has certain stages, and therefore requires a special metho-

dological approach. The analysis of publications revealed different approaches and models by which the innovation process is differentiated. Researchers in comparison of these different approaches have substantiated the choice of a linear model of the innovation process that has been used by many researchers. The stages of the innovation process were considered from these positions. For the first time a set of methods for the stages of basic and applied research was formed. Instead, for the needs of the proposed methodological approach, the similarity with the applied stages of the research is substantiated experimental development (experimental production and testing of prototypes), the initial mass production. Also for the first time it is proposed to consider the definition of the maximum amount of budget expenditures for the implementation of innovation processes as a financial goal of the study of basic and applied research. And as a task of financial research of basic and applied researches it is offered to define volumes of expenses of the state programs of development of national economy at separate stages of innovation process.

The matrix of forming the complexes of research methods of innovation process stages with the supposed tasks and results of financial activity formed for the first time has allowed to specify set of methods of research of basic and applied researches. The result of basic research should be the definition of state policy on a particular type of economic activity and funding schemes for scientific activities. And the result of applied research should be the ability to conclude about the financial potential of innovation and the possibility and feasibility of financing innovation development from state or regional programs.

The publication of results can be useful for researching the problems of innovation development, the implementation of stages of the innovation process.

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## **Методологія фінансових досліджень за етапами інноваційного процесу**

**Анотація.** У статті розглядаються питання, пов’язані з особливостями методології проведення фінансових досліджень на етапах інноваційного процесу. Важливою в авторському підході є постановка проблеми формування певного комплексу методів дослідження етапів інноваційного процесу з позицій фінансових результатів. У дослідженні були використані такі методи: діалектичний метод та методи аналізу та синтезу, методи порівняння та узагальнень, структурно-логічний аналіз. Для досягнення поставленої мети, а саме визначення складу методів дослідження інноваційного процесу за етапами, кожен з яких має свою специфіку і може вимагати оригінального набору методів, здійснено порівняльне аналізування взаємопов’язаних об’єктів дослідження, якими є інноваційний процес, життєвий цикл продукту (виробу, послуги, об’єкта), науково-технічна підготовка виробництва. Для досліджуваного об’єкта – інноваційного процесу, – зроблено аналіз і виокремлено два головних предмети дослідження, якими є певні етапи інноваційного процесу: фундаментальні і прикладні дослідження. Для кожного з них вперше з метою визначення фінансових цілей і завдань сформовано комплекси методів дослідження. Запропоновано розглядати визначення граничного обсягу бюджетних витрат на реалізацію інноваційних процесів як фінансову ціль дослідження об’єктів фундаментальних і прикладних досліджень. Сформована матриця комплексів методів дослідження етапів інноваційного процесу з передбачуваними завданнями та результатами фінансової діяльності. Отримані за результатами дослідження висновки можуть бути корисними для практичних працівників дослідних установ та організацій, аспірантів і студентів закладів вищої освіти при дослідженнях проблем інноваційного розвитку, реалізації етапів інноваційного процесу

**Ключові слова:** методи дослідження етапів інноваційного процесу, життєвий цикл продукту, науково-технічна підготовка виробництва, фінансові цілі дослідження, питання дослідження фінансової діяльності

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## Study of Risks in Confectionery Industry of Ukraine

**Abstract.** Enforced transformational processes caused by crisis situations, such as battle against consequences of the spread of COVID-19 pandemic and the formation of a socio-economic and security mechanism for counter fighting Russian war in Ukraine, are significantly reflected in the specifics of Ukraine's confectionery market operations today. It is determined that danger, instability, uncertainty, complexity and ambiguity accompany the development of various socio-economic systems, including confectionery market. The purpose of the article is to reveal the potential of the Ukrainian confectionery market in view of the intensification of competition in crisis situations, to identify the dominant influencing factors in the developmental environment of confectionery enterprises in order to design alternative competitive strategies to support their sales. The main goal is to present the results of the analysis of determinants of confectionery market development in Ukraine in the period of the spread of crisis situations in terms of identifying risks in the sector. Research methods are the method of economic analysis and comparison for researching the specifics of the confectionery market; abstract-logical method for theoretical generalisation and conclusions; calculation of confectionery market capacity and market shares of Ukrainian confectionery enterprises; index method for assessing the concentration levels in the confectionery market. Conclusions and added value of work: the specifics of Ukrainian confectionery market development are revealed. Analysis of the dynamics of the confectionery production volume in Ukraine has been carried out; the number of business entities in the segments characterised by types of economic activity and in terms of large, medium, small and micro enterprises has been identified. Analysis of export-import operations volumes has been carried out based on the commodity structure of foreign trade in confectionery products. The list of risks of the developmental environment of confectionery enterprises and intra-industry risks has been identified using the probabilistic method of risk assessment; analysis of factors affecting the dynamics of confectionery market development has been established in accordance with M. Porter's method of five forces of competition, an assessment of market concentration has been carried out using the index method (in particular, the Herfindahl-Hirschman index and the Lind index). According to the results of the evaluation of concentration levels of confectionery market in Ukraine and the factors affecting the conjuncture of this market, it has been identified that three enterprises are involved in the core of the confectionery market, namely SE "KK ROSHEN", PrJSC "HBF" and PrJSC "AVK". Forms of their interaction are secret conspiracies, the policy of dictating prices in order to maintain the market power of influence on industry counterparties and other stakeholders of the confectionery market, and other forms of interaction characteristic of an oligopolistic market structure

**Keywords:** confectionery market, market concentration, market share, Lind index, Herfindahl-Hirschman index, risks of economic activity, 5 forces of competition

### INTRODUCTION

Implementation of megatrends, introduced by globalisation and informatisation, in the activities of Ukrainian confectionery industry enterprises under the influence of crisis situations caused by the spread of pandemic and Russian

Federation's military invasion in Ukraine have significantly complicated the processes of managing all components of production and economic activity and led to an increase in external factors in the crisis threat. Internal problems

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in confectionery industry have worsen the ability to adapt to market challenges against the background of a decline in demand for confectionery products in favour of satisfying basic needs. They exacerbate competitive relations in the industry and create the need for preventive measures in terms of quick response to emerging threats. Therefore, the implementation of an effective system of early warning of the appearance of risk factors in Ukrainian confectionery industry in a strategic and short-term perspective is called for.

In addition, the identification of risks against the background of intensifying competition in the confectionary industry will contribute to reducing the negative consequences of threats and identifying positive effects under the conditions of risk acceptance for enterprises and their stakeholders, thereby contributing to the improvement of countermeasures against risks and the satisfaction of economic interests of owners and other interested parties.

The confectionery market in Ukraine, as a complex socio-economic system, actively demonstrates dynamic development of its individual segments, expansion of product range, improvement of consumer characteristics of confectionery products, therefore, it is accompanied by the intensification of competition between manufacturers, trade networks and distributors on the local, national and global levels of confectionery markets.

The impact of crisis situations, mainly the spread of COVID-19 pandemic and military actions of the Russian Federation in Ukraine, has led to significant disruptions in world trade in the target markets of the confectionery industry, complicated the conjuncture of the confectionery market in domestic and foreign markets, disrupted logistics export-import operations and caused a break in local logistics chains and caused problems in increasing the export of confectionery products with a high added value [1; 2].

In order to increase the presence of Ukraine in global food networks due to the active involvement of Ukrainian operators in global supply chains, and to harmonise competitive relations on the local and national markets of confectionery products, Ukrainian manufacturers have resorted to an in-depth analysis of the conjuncture of confectionery market in order to identify the influence of dominant factors in the environment of their development from the point of view of improving marketing and logistics in order to develop alternative competitive strategies to support their sales.

*The purpose of the work* is to present the results of a comprehensive analysis of the determinants in Ukrainian confectionery market development during the period of crisis situations.

The outline allowed the authors to put forward the task of researching the dynamics of Ukrainian confectionery market development in terms of:

- analysis of the dynamics of confectionery production volume in Ukraine in natural terms;
- identification of the number of economic entities in segments: by types of economic activity; in terms of large, medium, small and micro enterprises;

- analysis of the volumes of export-import transactions in terms of identification of the commodity structure of foreign trade in confectionery products;
- analysis of the retail turnover of enterprises of retail trade in confectionery and products;
- identification of risks in development environment of confectionery enterprises and intra-industry risks using the methodology of five forces of competition according to M. Porter and the index method of assessing the concentration levels of confectionery market in Ukraine.

## LITERATURE REVIEW

The main areas of research regarding the assessment of concentration levels of confectionery market in Ukraine, considering the risks of the environment in development of confectionery enterprises in Ukraine, have been determined through the symbiosis of a significant number of areas of research.

In particular, the analysis and determination of prospects in the development of confectionery market of Ukraine, among other things, were carried out by such groups of scientists as A.A. Voronin, who studied trends in the development of confectionery industry and drew conclusions about the high potential of the industry due to effective management and other internal competitive advantages [3]; K.A. Demianenko, who continued the analysis of the dynamics of confectionery market by regions and types of products with the involvement of world experience and revealed the dominant competitive advantage of the Ukrainian confectionery market, based on price [4]. A.V. Zahrychanska and V.Ya. Holiuk in their works focused on the study of the competitive advantages of Ukrainian confectionery enterprises and according to the results of the study, identified the main ones, notably, a wide range of products, qualified personnel, reputation on the market, a wide sales market [5]. A.A. Zaynchkovskyi et al. focused attention on identification of product offers by confectionery manufacturers; the conclusions regarding the high level of competition in the confectionery market, saturation and a wide range of dynamically updated products should be considered in the scientific work of the authors; expanding the geography of exports and strengthening the target offer on the domestic market are proposed as promising directions of development [6]. M.V. Shashyna focused attention on the organisational and technological processes of production of confectionery enterprises, and also presented results on increasing competitiveness and further promotion of products on the foreign and domestic markets [7]. O.S. Kilnitska et al., as a result of the confectionery market research, provided recommendations on improving the assortment, promotion and sales of commercial products in the industry [8]. V. Samofatova & T. Bova investigated the factors influencing the improvement of competitiveness of confectionery enterprises in Ukraine and, according to the results of the study, attributed the market positions of enterprises, product quality and ownership, marketing measures

to increase sales, flexibility of the product range, the possibility of export, diversification in search for new ways of selling goods in Ukraine [9]. The work of A.V. Hrytsyshyn, who proposed an improved method of automated accounting of transportation of material values using global positioning technology in confectionery industry; to implement the principle of “chaotic storage” of material values in free warehouse spaces into the system of accounting for logistics costs using electronic documentation of logistics operations, inventory of material stocks and identification of value; and also suggested positioning the warehouse as a center of responsibility and a center of costs [10].

In her scientific work H.V. Razumova et al. [11] determined the components of risk in setting the price for the products of Ukrainian confectionery enterprises, as well as the main reasons for their occurrence. The choice of enterprises – manufacturers of confectionery products when forming a marketing pricing strategy is analysed. Recommendations are provided regarding the feasibility of applying the competition-oriented pricing method, as well as suggestions for increasing the efficiency of Ukrainian enterprises in the confectionery market of Ukraine. In the paper [2], the authors H.V. Razumova and O.V. Oskomova continued the study of the confectionery market of Ukraine, according to the results of which it was established that the stable development of the confectionery industry for the country's economy will make it possible to simultaneously stimulate the development and growth of production in the field of rural economy, transport and logistics sphere, trade, increase the employment of the population, as well as significantly increase the country's export potential.

In her work M.A. Saiensus investigated the organisational and economic foundations of cold logistics management of confectionery enterprises thanks to the study of the concept of cold logistics in the supply chains of confectionery products and developed a model of the network design of the cold supply chain of food industry enterprises in the conditions of sustainable logistics formation, carried out an assessment of the effectiveness of the logistics activities of food industry enterprises, which are included in the cold supply chain [12]. At the same time, despite the diversity of the authors' research on the development of the confectionery market, the assessment of the concentration of the confectionery market on the basis of a comprehensive analysis of the factors influencing the development environment of the industry's counterparties, taking into account the significant risks that arose during the crisis period of 2019-2022, is insufficiently covered, which signifies the relevance of this study.

## MATERIALS AND METHODS

In accordance with the criterion of professional qualitative and quantitative dynamics of evaluating confectionery market development in Ukraine, the work uses materials from monographic and dissertational studies, scientific periodical publications, the results of research by consulting agencies and the opinions of experts in the confectionery

industry and materials from comprehensive statistical publications for the period 2014-2022. The use of statistical publications made it possible to analyse the dynamics of the number of economic entities on the confectionery market of Ukraine by types of economic activity and by the segmentation of entities of large, medium, small and micro enterprises; the structure of the volume of production of confectionery products by the width of the product range; the commodity structure of foreign trade in confectionery products using the export-import coverage ratio to reflect the ratio of export-import operations; retail turnover of Ukrainian confectionery retail enterprises by product group.

Therefore, the collection and analysis of statistical materials made it possible to structure the number of business entities in the confectionery market, including the identification of entities of large, medium, small and micro enterprises, to assess the ratio of export and import of products of the confectionery industry; calculate the capacity of the Ukrainian confectionery market and the capacity of its macro-segments, in particular, the capacity of the flour and sugar confectionery retail markets; shares of these sectors in the structure of the Gross Domestic Product of the country.

The study of the quantitative parameters of the conjuncture of the confectionery market of Ukraine is supplemented by the authors with a qualitative analysis and classification of the main risks in this industry. The identification of the specificity of one of them, namely the aggravation of various types of competition in the confectionery market of Ukraine, was carried out with the help of the toolkit of five forces of competition according to M. Porter [12]. Further detailing of the analysis of the risks of intensifying competition in the confectionery market was carried out using the Gervindahl-Hirschman Index and the Lind Index, which obliged the authors to determine the market shares of individual counterparties – leaders in the confectionery market of Ukraine (using the analysis of secondary reporting of the studied enterprises) and supplemented probabilistic assessment of the influence of competition forces in the confectionery industry.

Methods used in the study, such as statistical analysis of the dynamics of the confectionery market development, the index method for the quantitative assessment of individual segments of the confectionery market in Ukraine, supplemented by the results of a qualitative assessment of the levels of competition in the confectionery industry (the method of five forces of competition according to M. Porter) are of a systemic nature and allow us to understand the specifics of the competitive environment in the confectionery industry and the intensity of competition in the core of the studied market.

## RESULTS AND DISCUSSION

The confectionery market is one of the most dynamic and competitive markets in Ukraine. 90% of products on the confectionery market are supplied by Ukrainian manufacturers, only 10% of them are imported goods, which indicates a high level of competition in the confectionery industry [13]. The authors recommend structuring the

confectionery market in Ukraine into the following segments according to the macro-segmentation grid based on the types of economic activity (which are fully consistent with the structuring of the studied market in statistical sources of information):

- production of cocoa, chocolate and sugar confectionery;

- production of crackers and biscuits; production of long-storable flour confectionery, cakes and pastries.

Positive dynamics of the development of Ukrainian confectionery market during 2016-2019 in terms of the analysis of the number of business entities in its main segments are noteworthy (Table 1).

**Table 1.** Analysis of the dynamics of the number of business entities on the Ukrainian confectionery market by type of economic activity, unit

Segment	2016	2017	2018	2019	2019/2016
Production of cocoa, chocolate and sugar confectionery (type of economic activities – 10.82)	424	477	485	526	1.3
Production of crackers and dry biscuits; production of long-storable flour confectionery, cakes and pastries (type of economic activities – 10.72)	1575	1496	1533	1555	0.9

**Source:** systematised on the basis of [14]

According to the analysis, the number of business entities in the “Production of cocoa, chocolate and sugar confectionery” segment increased by 30% in 2016-2019, which indicates the promising development of this segment in terms of the number of potential participants. In contrast, the rate of growth of the number of economic entities in the

segment “Manufacture of crackers and dry biscuits; production of flour confectionery, cakes and long-storable cakes” decreased by 10% over the same period [15]. An analysis of the dynamics of the number of subjects of large, medium, small and micro enterprises in the confectionery industry is given in Table 2.

**Table 2.** Analysis of the dynamics of the number of subjects of large, medium, small and micro enterprises in the confectionery industry in Ukraine by the type of economic entity, units

Type of business entity	Years				
	2015	2016	2017	2018	2018/2015
Large enterprises	6	4	3	6	1.0
Medium-sized enterprises	248	244	247	274	1.104
Small enterprises	5179	4983	4946	5179	1.0
Micro enterprises	4775	4566	4490	4648	0.97
Total	10208	9797	9686	10107	0.99

**Source:** systematised on the basis of [14]

Analysis confirmed the renewal of the number of large and small enterprises in the confectionery industry in 2018, in accordance with 2015 (6 and 5179 entities, respectively); the number of medium-sized enterprises in

2018 was 274 or (110.48%) compared to 2015; the number of micro-entrepreneurs in 2018 was 97% of 2015 or 4.648 contractors. Analysis of the dynamics of confectionery production in Ukraine is given in Table 3.

**Table 3.** Analysis of the dynamics of Ukrainian confectionery production volume according to the product offer, thousand tons

Products	2016	2017	2018	2019	2019/2016
Sweet biscuits	163	177	171	159	0.9
Waffles and waffle products	49.5	51.0	51.2	52.6	1.1
Chocolate in briquettes, plates or tiles	16.5	18.6	22.2	24.7	1.5
Chocolate sweets	52.3	53.3	53.4	66.6	1.3
Confectionery products made of sugar or its substitutes, with cocoa content	70.3	70.4	64.4	47.0	0.6
Chewing gums, fruit jellies and fruit pastes in the form of sugar confectionery	39.7	41.0	44.2	47.7	1.2
Boiled candies and chewing gum	29.3	23.0	21.6	29.3	1.0
Caramels, toffee and similar sweets	75.6	78.3	75.1	77.6	1.0
Total	333.2	512.6	503.1	504.5	-

**Source:** systematised on the basis of [14]

According to the results in the Table 3 in the structure of the production volume of Ukrainian confectionery in 2019.

The three leading segments are occupied by the following sectors: production of sweet biscuits – 159 thousand tons (or 30%);

production of caramel, toffee and similar sweets – 77.6 thousand tons (with a share of 15%) and chocolate candies – 66.6 thousand tons or 13% of the total. Boiled candies and chewing gum take the smallest share in the volume

of production – 6% (29.3 thousand tons) and chocolate in sugar briquettes – 5% (or 24.7 thousand tons). The commodity structure of foreign trade in confectionery products by macro-segments is analysed in Table 4.

**Table 4.** Analysis of the commodity structure of foreign trade in confectionery products in Ukraine in 2019 by the export-import coverage ratios

Segment	Import		Export		Export-import coverage ratio
	Thousand US dollars	In % of the total	Thousand dollars USA	In % of the total	
<b>Total:</b>	50054606	100	60800173	100	1.2147
Sugar and sugar confectionery	25389.7	0.0507	70485.4	0.1159	2.7761
Cocoa and cocoa products	204586.6	0.4087	327139.7	0.5381	1.5990
Flour confectionery	269366	0.5381	200744.6	0.3302	0.7453

**Source:** systematised on the basis of [14]

The authors supplement the analysis of the commodity structure of foreign trade in confectionery products, unlike other authors, with the export-import coverage ratio in the confectionery industry, which details the research and reveals the specifics of the ratio of export-import operations in the industry.

In the sector of sugar production and sugar confectionery in 2019, the export-import coverage ratio was 2.7761, which indicates a significant predominance of exports over imports (USD 70.485.4 thousand compared

to USD 25.389.7 thousand, respectively). In the production of cocoa and cocoa products, the export-import coverage ratio was 1.5990, which also indicates the predominance of exports over imports (327.139.7 versus 204.586.6 thousand US dollars, respectively). The export-import coverage ratio for the flour confectionery sector demonstrates the opposite situation – imports outweigh exports, so the export-import coverage ratio was 0.7453. The analysis of the retail turnover of confectionery retail enterprises is given in Table 5.

**Table 5.** Analysis of retail turnover of confectionery retail enterprises. 2017-2021. Million UAH

Products	2017	2018	2019	2020	2021	2021/2017, %
Flour confectionery products	9921.1	12147.3	14691.4	15502.4	19040.7	1.9192
Sugar confectionery	16962.6	21997.4	26225.0	28366.7	33782.5	1.9991
Total	26883.7	34144.7	40916.4	43869.1	52823.2	1.9649

**Source:** systematised on the basis of [14]

In 2021 the retail turnover of flour confectionery retail enterprises amounted to UAH 19.040.7 million, which is 91.92% more than the corresponding sales volume in 2017 (UAH 9.921.1 million). The retail turnover of sugar confectionery in 2021 amounted to UAH 33.782.5 million, which is UAH 16.819.9 million; more than in 2017 (99.91% more than in the previous period).

It is proved that Ukrainian confectionery market is developing dynamically. According to the authors' calculations, the capacity of the confectionery retail market in 2021 amounted to UAH 52.823.2 million, which is 96.49% more than in 2017. The authors suggest choosing flour confectionery and sugar confectionery as macro-segments of the confectionery market. It was found that export volumes significantly exceed the volume of confectionery imports in Ukraine, identified by the export coverage ratio of confectionery imports, which in 2019 was 1.2147. The "sugar and sugar confectionery" segment has the largest spread in the ratio of exports and imports. Therefore, the export-import coverage ratio is 2.7761.

Note that in the context of the research methodology, with the aim of introducing a clear identification of the content of the signs of structuring of the Ukrainian confectionery market, the authors proposed to expand the structuring of the subjects of the confectionery market according to the following characteristics: types of economic activity; by the type of economic entities, the product offer of industry producers, which have been researched by other authors, but have not been identified according to such characteristics.

*Analysis of risks in the confectionery industry.* Studying the dynamics of the development of Ukrainian confectionery market and observing the specifics of its conjuncture allows us to identify and characterise the risks in this industry. Among the most tangible risks in the confectionery sector, we can highlight: economic risks associated with the spread of COVID-19 pandemic; political risks associated with military aggression on the part of the Russian Federation and industrial risks – dependence on foreign suppliers of raw materials, logistical risks and a high level of various types of competition.

Economic risks associated with the spread of COVID-19 pandemic. The spread of COVID-19 pandemic had the effect of reducing the solvent demand of end consumers, who primarily turned to meeting basic needs. Priority was given to essential goods and affordable (cheaper) goods. Private label products of retail chains, which are much cheaper in their product categories, have gained popularity. Also, consumer

preferences are changing dramatically: the popularity of healthier alternatives to sweets or sweets with less sugar content, containing healthy ingredients, the popularity of snacks and sweets based on plant-based or lactose-free milk, as well as vegan products is increasing. Analysis of the dynamics of confectionery sector development in the structure of Ukraine's GDP is given in Table 6.

**Table 6.** Analysis of the dynamics of confectionery sector development in the structure of Ukraine's GDP for 2016-2021

Year	Nominal GDP (in actual prices, UAH million)	Flour confectionery retail market capacity, in thousand UAH	The capacity of retail market of sugar confectionery, thousand UAH	The total capacity of confectionery market, thousand UAH	Share in GDP, %
2016	2383182	1579501.3	1436726.0	3016227.3	0.12656
2017	2982920	1665090.5	1430403.5	3095494	0.10377
2018	3558706	1724943.1	1690275.2	3415218.3	0.09597
2020	4194102	1706304.7	1872485.9	3578790.6	0.08533
2021	5459574	1754081.3	1994197.5	3748278.8	0.06866
2021/2016	2.3	1.1	1.4	1.2	0.54251

**Source:** systematised on the basis of [14]

The share of confectionery sector in the structure of Ukrainian GDP in 2021 was 0.0686%, which is 54.25% of the similar indicator in 2016 (0.1265%). The decrease in the share of the confectionery sector in the share of GDP indicates the narrowing of the share of the confectionery sector in the GDP structure in favor of the development of other industries. Note that in previous studies, other authors do not calculate the capacity of the confectionery market by assessing the capacity of its macro-segments and do not identify the impact of the development of the confectionery market in the structure of the country's GDP.

So, the impact of COVID-19 pandemic on the development of the sector, which is illustrated by its share in the structure of GDP, indicated a significant decrease in the capacity of this sector by 0.05791 g.p. for the period 2016-2021.

Political risks associated with military aggression by the Russian Federation. According to the forecast of the World Bank from April 10, 2022 in connection with the military invasion of the Russian Federation the GDP of Ukraine will decrease by about 45% [16]. During the illegal military actions of the Russian Federation on the territory of Ukraine, numerous infrastructure objects of the confectionery industry were destroyed or damaged (for example, the Mondelez Ukraine PJSC factory in Trostyanets, with assets of 104 million dollars and income in 2020 of 7.2 billion UAH and 900 employees) [13].

*Dependence on foreign cocoa beans suppliers.* The essence of the risk is the impossibility of controlling the stocks of raw materials or production components, as well as the complication of the pricing process due to the risks of price increases due to the reduction of raw material stocks. The main raw material for chocolate products is cocoa beans, which is an imported product. Growing cocoa trees requires special conditions – a humid climate, frequent

rains and a small number of dry days. This is explained by the territorial location of cocoa plantations on both sides of the equator. With a global environmental catastrophe, climate change is having a devastating effect on the cocoa bean growing industry. A significant proportion of cocoa tree plantations die due to floods, droughts, aging of the soil or from pests. Accordingly, prices for cocoa beans increase in connection with the limitation of raw materials, which is reflected in the final price of the finished product [6; 15].

*Logistics risks.* COVID-19 pandemic caused an imbalance in cargo flows, due to changes in demand for cocoa beans, as well as the cessation of production during lockdowns and beginning of quarantine restrictions. The main reasons for the decrease in freight flows are: border closures, a decrease in demand due to decrease in the purchasing power of the population, the closure of retail outlets, an increase in currency value, quarantines, and an aggravation of the epidemic situation. The consequences are a slowdown in imports and goods supply in the country, a suspension of exports, which represents a risk of European agricultural crisis, since Ukraine is one of the largest suppliers of agricultural products to the EU countries. According to data, in 2021, the supply of agricultural products amounted to 8.4 billion dollars [12]. Slow processes of import of such a strategic product as cocoa beans are critically felt in the confectionery industry of Ukraine. For example, Table 7 provides an assessment of the efficiency of logistics and logistics risks with the example of cold supply chains, taking into account the impact of food safety risks, factors of the food system functioning, considering external factors of influence (rapid changes in climatic conditions or products, as required by special conditions of transportation; risks of system failures, which are more sensitive for cold supply chains than for chains operating at room temperature).

**Table 7.** Indicators for evaluating the efficiency of logistics and logistics risks of cold supply chains of confectionery products

Evaluation of logistics efficiency		Supply chain safety	Supply chain complexity	Assessment of logistics risks	
Max. rating	Gradation			Max. rating	Gradation
5.75	Average	2-4	3-4	4.09	Average

**Note:** The evaluation is carried out on a 10-point scale, where 10 is the highest rating

**Source:** systematised on the basis of [12]

The analysis of Table 7 shows that the confectionery production sector is characterised by average logistics risks, which are calculated based on the assessment of logistics efficiency, security and complexity of the confectionery supply chain. The evaluation of the efficiency of logistics of confectionery supplies is estimated at 5.75 points out of 10, which indicates an average level of efficiency. The security of the confectionery supply chain is rated at 2-4 points out of 10, which is a sign of an insufficient level of security of the chain. The complexity of the confectionery supply chain is defined as not complex with a score of 3-4 points out of 10. The average level of logistics efficiency for the confectionery supply sector is the result of a medium degree of adaptability to changes in the external environment.

*High level of competition in the confectionery market of Ukraine.* The intensity of competition in the confectionery market is determined not only by the level of industry competition, but also the potential of foreign companies to enter the market, the intensity of competition between substitute goods and the impact on the complementary goods industry, the strength of pressure from suppliers and consumers of confectionery products, the influence of institutions and the level of state regulation, interests of stakeholders, the intensity of competition in logistics supply chains in the confectionery market, the potential of marketing in expanding the market share of individual counterparties and other factors. The logic of competition research actualises in the use of M. Porter five forces of competition instrument (Table 8).

**Table 8.** Analysis of five forces of competition according to M. Porter in the confectionery market of Ukraine

No.	Force	Description
1	Competition between existing firms	In the market, 80% of the power belongs to domestic enterprises. In the Ukrainian confectionery market, the share of foreign companies (Mars Corporation, Ferrero International and others) does not exceed 10%, which indicates the intensifying competition between Ukrainian manufacturers and the presence of formal barriers to entry into the confectionery industry.
2	Barriers for new participants	The Ukrainian confectionery market is at the stage of saturation. Therefore, the entry of a new participant and its conquest of a significant share of the confectionery market is a difficult and unlikely process. In addition, there are such barriers for new participants in the confectionery market, such as the need for high-quality production facilities, laboratories for input and output quality control of raw materials and finished products. Compliance with food regulations, domestic and international quality standards, the need for significant personnel costs, development of goods, procurement of raw materials, innovations in the manufacturing process, provision of necessary conditions for storage and supply of goods, etc. Leaders of the confectionery market also actively apply measures of price competition and the effect of scale.
3	Market power of buyers	In the confectionery market of Ukraine, the study of consumer preferences is relevant. since the trend of healthy food alternatives (sweets with a lower sugar content, vegan sweets, sweets based on lactose-free or vegetable milk) is spreading throughout the country. Price is the main criterion when choosing a product on the Ukrainian market, especially for such audiences as older people and children.
4	Market power of suppliers	The confectionery industry is completely dependent on the import of cocoa beans. Now there is a global shortage of this raw material, which causes an increase in the prices of cocoa beans and cocoa powder, which are the main ingredients for making chocolate products. As a result, the final price of products increases, which is not a positive phenomenon, taking into account the purchasing power of the population. Also, the number of suppliers of cocoa beans is small, if compared, for example, with the number of suppliers of milk or sugar, which allows the supplier to dictate its rules in the confectionery market.
5	Threat of substitute products or services	On the confectionery market, manufacturers offer a wide range and nomenclature of products in the same categories. The appearance of substitute products on the Ukrainian market is unlikely.

**Source:** own design

The weighted assessment method was used to analyse the influence of competition factors. The assessment of the impact is carried out on a 5-point scale, where 5 points is

the maximum score, the total weight of the criteria is 1. The assessment of the impact of the forces of competition in the confectionery industry is given in Table 9.

**Table 9.** Assessment of the influence of competition forces in the confectionery industry of Ukraine

No.	Force	Weight	Mark	Influence (+; -)	Weighted mark
1	Competition between existing firms	0.2	5	-	1.0
2	Barriers for new participants	0.2	3	+	0.6
3	Market power of buyers	0.2	3	-	0.6
4	Market power of suppliers	0.3	5	-	1.5
5	Threat of substitute products or services	0.1	1	-	0.1
Total		1	-	-	3.6

**Source:** designed by authors

The most influential factors are the market power of suppliers (weighted score of 1.5) and the level of competition in the industry (weighted score of 1.0). The lowest impact coefficients are determined by such a criterion as a threat from interchangeable products or services (weighted score of 0.1), since it is unlikely and will not significantly affect large market players. Criteria such as market power of buyers (weighted score of 0.6) and barriers to new entrants (weighted score of 0.6) have a medium impact. Consumer preferences are changing, so manufacturers need to constantly monitor new trends and meet new consumer needs. There are quite a lot of barriers to entering the confectionery market, first of all, a high level of competition, the need

for strong financing, strict requirements for manufacturers, so the threat of a newcomer gaining a significant share of the market is very small.

The risk of a high level of competition in the industry is manifested in the difficulty of entering the confectionery market due to the presence of strong competitors with a significant market share. The confectionery market in Ukraine is controlled by several largest manufacturers. The leader is SE “KK ROSHEN” with a market share of 28.73%. Among the largest companies in the confectionery market of Ukraine are PrJSC “HBF”, PrJSC “AVK” and JSC “VO Konti”. An analysis of the dynamics of the volume of confectionery production in Ukraine is given in Table 10.

**Table 10.** Analysis of the dynamics of the volume of confectionery production in Ukraine, 2018-2020

No.	Name of company	Volume of production. tons			2020/ 2018	Market share. %			2020/ 2018
		2018	2019	2020		2018	2019	2020	
1	SE “CC “ROSHEN”	205112	194168	200834	0.98	23.29	29.59	28.73	1.23
2	PJSC “HBF”	50619	52873	55357	1.09	6.07	7.63	7.92	1.30
3	PJSC “AVK”	97958	41780	53132	0.54	11.75	6.03	7.60	0.65
4	JSC “VO “Conti”	32348	30996	29953	0.93	3.88	4.47	4.29	1.11
5	“MIR” Confectionery Factory LLC	16245	16210	21666	1.33	1.95	2.34	3.10	1.59
6	PJSC “Mondelis Ukraine”	25150	19793	21576	0.86	3.02	2.86	3.09	1.02
7	PJSC «Lviv Confectionery Factory “Svitoch”	22561	20480	20175	0.93	2.71	2.95	2.88	1.06
8	PJSC “Dominik”	19805	19711	18468	0.94	2.38	2.84	2.64	1.11
9	Zhytomyr Lasoshchi PJSC	38767	32651	14780	0.38	4.65	4.71	2.11	0.45
10	Lagoda PJSC	12762	12852	11942	0.94	1.53	1.85	1.71	1.12
11	“Kviten” Confectionery Factory LLC	7289	5393	6532	0.90	0.87	0.78	0.93	1.07
12	Zaporizhia Confectionery Factory PJSC	7289	3214	3935	0.54	0.36	0.46	0.56	1.56
	Others	302161	833789	240620	0.80	37.54	33.489	34.44	0.92
	Total	833789	833789	698970	0.84	100	100	100	-

**Source:** systematised on the basis of secondary reporting of enterprises in the confectionery industry

In the structure of confectionery production in Ukraine, the three leading positions in 2020 are occupied by enterprises such as “Roshen” Confectionery Corporation. “HBF” PrJSC and “AVK” PrJSC with the volumes of products of 200.834 tons, 55.357 tons and 53.132 tons, respectively. Examining the dynamics of production growth in 2021 compared to 2018, the upward trend is characterised by MIR Confectionery LLC with an increase in production by 33.37% and KhBF PJSC – by 9.36%. In 2020, 44.25% of the market is occupied by SE “KK ROSHEN”. PrJSC “HBF”

and PrJSC “AVK” with a market share of 28.73%, 7.92% and 7.60%, respectively. Having analysed the dynamics of the distribution of market shares among enterprises in the confectionery industry from 2018 to 2020, it can be stated that the most dynamic growth is characterised by such enterprises as PJSC “Zaporizhskaya Confectionery Factory” – 55.56% (market share in 2018 – 0.36%, in 2020 – 0.56%) and LLC “MIR Confectionery Factory”, whose market share in 2020 was 3.10%, which is 58.97% more than in 2020 (1.95%).

Considering the significant number of subjects of large, medium, small and micro enterprises in the confectionery industry (10.107 subjects, 2018), as well as the high level of sector competition, it is advisable to use the assessment of the level of concentration of the confectionery market, in particular, using the Gervindahl-Hirschman Index (1):

$$HHI = \sum Y_i^2 \tag{1}$$

where  $Y_i$  – market share of companies in the industry:  
 $HHI=28.73^2+7.92^2+7.60^2+4.29^2+3.10^2+3.09^2+2.88^2+2.64^2+2.11^2+1.71^2+0.93^2+0.56^2+34.44^2=965.9$ .

This indicator shows that the confectionery market is very saturated. The Lind Index was used to determine the degree of inequality between the leading players in the confectionery market:

– for two players (SE “CC “ROSHEN and PJSC “HBF”) (2):

$$I_L = \frac{K1}{K2} \times 100\% \tag{2}$$

where  $K1, K2$  – market share of the first and second largest companies:

$$I_{L2} = I_{L2} \frac{28.73}{7.92} \times 100\% = 362.8\%$$

– for three players (SE “KK ROSHEN”, PJSC “HBF” and PJSC “AVK”) (3):

$$I_{L3} = \frac{1}{2} \times \left( \frac{K1}{(K1 + K3): 2} + \frac{(K1 + K2): 2}{K3} \right) \times 100\% \tag{3}$$

where  $K1, K2, K3$  – market share of the first, second and third largest companies:

$$I_{L3} = \frac{1}{2} \times \left( \frac{28.73}{(28.73 + 7.60): 2} + \frac{(28.73 + 7.92): 2}{7.60} \right) \times 100\% = 305.8\%$$

– for four players (SE “KK ROSHEN”, PJSC “HBF”, PJSC “AVK” and JSC “VO “Konti”) (4):

$$I_{L4} = \frac{1}{3} \times \left( \frac{K1}{(K2 + K3 + K4): 3} + \frac{(K1 + K2): 2}{(K3 + K4): 2} + \frac{(K1 + K2 + K3): 3}{K4} \right) \times 100\% \tag{4}$$

where  $K1, K2, K3, K4$  – market share of the first, second, third and fourth largest companies:

$$I_{L4} \frac{1}{3} \times \left( \frac{28.73}{(7.92 + 7.60 + 4.29): 3} + \frac{(28.73 + 7.92): 2}{(7.69 + 4.39): 2} + \frac{(28.73 + 7.92 + 7.60): 3}{4.29} \right) \times 100\% = 362.4\%$$

According to the results, there are three enterprises in the core of the confectionery market: SE “KK ROSHEN”, PrJSC “HBF” and PrJSC “AVK”. They support the oligopolistic form of competition in the market, which is characterised by the presence of a few of the strongest players, the formation of price policy by reducing prices using the effect of scale in order to crowd out competitors, secret conspiracies among the strongest participants and other forms of interaction.

It is advisable to summarise the results of the risk study in tabular form (Table 11) for the purpose of a general assessment of risks in the field of confectionery production in Ukraine.

**Table 11.** Research of risks in the field of confectionery production in Ukraine, considering probability impact of their occurrence

No.	Risk	Probability of occurrence	Impact	Integral mark
1	Economic risks associated with the spread of COVID-19 pandemic	4	3	12
2	Political risks associated with military aggression of the Russian Federation	5	4	20
3	Dependence on foreign suppliers of cocoa beans	4	5	20
4	Logistics risks	3	3	9
5	High level of competition in the confectionery market of Ukraine	4	4	16

**Note:** factors are evaluated on a five-point scale, where 5 is the maximum score

**Source:** designed by the author

Analysing the results of the study of risks in the field of confectionery production in Ukraine, it is appropriate to highlight that the greatest risks are political, related to military aggression by the Russian Federation and dependence on foreign suppliers of cocoa beans with an integral assessment of 20 points out of a possible 25. The highest integrated assessment for risks associated with military aggression by the Russian Federation is justified by the military situation

on the territory of Ukraine. The risk of dependence on foreign suppliers is associated with an environmental disaster and a decrease in the amount of the main raw material for the production of confectionery – cocoa beans. The risk of a high level of competition in the confectionery market of Ukraine was assessed at 16 points, which is 4 points less than the previous two. The confectionery market of Ukraine has an oligopolistic character, where market power is concentrated between

the three largest enterprises. The economic risks associated with the spread of COVID-19 pandemic were assessed with an integral score of 12 points. This trend can be attributed to the decline in the spread of COVID-19. The lowest degree of risk among the enterprises in the confectionary industry of Ukraine considered are logistical risks with an assessment of 9 points. Logistical risks were partly related to the spread of COVID-19 pandemic. Therefore, taking into account the improvement of the sanitary-epidemic situation, the establishment of clear rules regarding quarantine restrictions, work regime and vaccination, logistical risks have decreased. However, the issue of food safety risks and the risks of systemic failures of confectionary supply chains still pose a threat to reducing the efficiency of confectionary supply logistics.

It should be noted that the work uses the author's vision regarding the structure of the research process of the Ukrainian confectionary market. The specificity of the conducted research is revealed through the prism of focusing on the concentration levels of the confectionary market, taking into account the influence of macro-environmental factors and assessing the share of the confectionary sector in the GDP structure, the main forces of competition in the confectionary industry (through a qualitative and quantitative assessment of the risks of the developmental environment of the counterparties of the confectionary market), and therefore, the need to assess the share of the main players of the studied market; as well as analysis of the competitive core of the Ukrainian confectionary market.

## CONCLUSIONS

The modern confectionary market of Ukraine is one of the largest sectors of the food industry, which is characterised by the presence of a significant number of manufacturers. The high rate of development of the confectionary industry contributes to the aggravation of competitive relations between the counterparties of the confectionary market and affects the efficiency of the industry. The study of competitive forces in the industry (with the help of M. Porter's five forces methodology) with the application of identification of the concentration levels of the Ukrainian confectionary market made it possible to establish that the core of the

confectionary market includes the three leaders of the industry (CC "Roshen", PJSC "HBF" and PJSC "AVK"), which support an oligopolistic form of competition in the market.

In addition to the high level of competition in the confectionary market of Ukraine, barriers have been formed for new participants to enter the market, which are represented by the need for powerful financial, production and personnel resources. The market is characterised by constant study of consumer preferences and attempts to satisfy consumer needs. One of the most important characteristics of the confectionary market of Ukraine is the presence of dependence on imported raw materials (dominantly cocoa beans), which represents the powerful market power of suppliers.

The functioning of enterprises on the confectionary market under the conditions of crisis situations related to overcoming the consequences of the spread of COVID-19 pandemic and military actions by the Russian Federation in Ukraine, demonstrated the need for a significant restructuring of marketing and logistics activities on the territory of Ukraine in view of the disruption of logistics link ties and the need to ensure the safety of production and logistics processes, as well as the high sensitivity and derivative nature of demand in relation to the specifics of satisfying the needs of end consumers of confectionary products under the influence of force majeure, since the latter turned to satisfying basic needs.

Enterprises of the confectionary industry, which follow the trends of their developmental environment in terms of adapting production and economic activities to the specifics of the security environment, will be able to maintain the level of competitiveness in crisis situations by consolidating participants in the confectionary market and avoiding the exit of weak counterparties from the market; to create a product offer demanded by the market and to reconstruct the processes of organisation of logistics activities, as well as to strengthen its strategic positions in the studied market.

Inherent to the Ukrainian confectionary market, the aggravation of intra-industry competition requires industry producers to form effective functional development strategies in the target confectionary markets of Ukraine, which should become the subject of a separate study.

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## Дослідження ризиків в кондитерській галузі України

**Анотація.** Вимушені трансформаційні процеси, спричинені кризовими ситуаціями, як-от боротьба з наслідками поширення пандемії COVID-19 та формування Україною соціально- економічного та безпекового механізму протидії війні, суттєво відобразилися на специфіці функціонування ринку кондитерських виробів у державі. Означено, що небезпека, нестабільність, невизначеність, складність та неоднозначність супроводжують розвиток різних соціально-економічних систем, у тому числі ринок кондитерських виробів. Метою статті є розкрити потенціал українського ринку кондитерських виробів з огляду на загострення конкуренції в умовах кризових ситуацій, виявити домінуючі чинники впливу в середовищі розвитку кондитерських підприємств задля розробки альтернатив конкурентних стратегій для підтримки своїх продажів. Основна ціль: представити результати аналізу детермінант розвитку ринку кондитерських виробів в Україні в період поширення кризових ситуацій в частині ідентифікації ризиків в секторі. Методи дослідження: метод економічного аналізу та порівняння для дослідження специфіки ринку кондитерських виробів; абстрактно-логічний метод для теоретичного узагальнення та висновків; розрахунок місткості ринку кондитерських виробів та часток ринку кондитерських підприємств України; індексний метод для оцінювання рівнів концентрації ринку кондитерських виробів. Висновки та додана вартість роботи: розкрито специфіку розвитку українського ринку кондитерських виробів. Проведено аналіз динаміки обсягів виробництва кондитерських виробів в Україні; ідентифіковано чисельність суб'єктів господарювання у сегментах, ідентифікованих за видами економічної діяльності та у розрізі великого, середнього, малого та мікропідприємництва. Проведено аналіз обсягів експортно-імпортних операцій за ознакою товарної структури зовнішньої торгівлі кондитерськими виробами. Ідентифіковано перелік ризиків середовища розвитку кондитерських підприємств та внутрішньо галузевих ризиків із застосуванням імовірнісного методу оцінки ризиків; проведено аналіз чинників впливу на динаміку розвитку ринку кондитерських виробів згідно методики п'яти сил конкуренції за М. Портером, здійснено оцінювання концентрації ринку із застосуванням індексного методу (зокрема, індексу Херфіндаля-Хіршмана та індексу Лінда). За результатами оцінювання рівнів концентрації ринку кондитерських виробів в Україні та чинників впливу на кон'юнктуру даного ринку встановлено, що до ядра ринку кондитерських виробів залучено три підприємства, а саме ДП “КК “РОШЕН”, ПрАТ “ХБФ” та ПрАТ “АВК”, формами взаємодії яких є таємні змови, політика диктування цін задля утримання ринкової сили впливу на контрагентів галузі та інших стейкхолдерів кондитерського ринку та інші форми взаємодії, властиві для олігополістичної структури ринку

**Ключові слова:** ринок кондитерських виробів, концентрація ринку, ринкова частка, індекс Лінда, індекс Херфіндаля-Хіршмана, ризики економічної діяльності, 5 сил конкуренції

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## Employees' Types of Intelligence Assessment Method in Accordance with the Elements of the Five-Factor Model Considering Life Cycle Stage

**Abstract.** Operational conditions of enterprises in the VUCA environment (Volatility, Uncertainty, Complexity and Ambiguity) are characterised by drastic changes in the socio-economic sphere, instability and high level of stress. An increasing number of scientific studies confirm the significant influence of socio-psychological factors on the productivity of an employee, so the task of their effective evaluation should be performed by the management of enterprises. The purpose of the article is to develop tools for evaluating the system of social and psychological indicators, based on the multiplicity of manifestation forms of employee's intelligence. The article presents the author's method of assessing the types of intelligence of employees according to the elements of the five-factor model, taking into account the stages of their life cycle. The proposed method consists of three consecutive stages: reconciliation of the results of the assessment methods application with each element of the five-factor model of the employee's intelligence using the wall method; establishment of connection between the stages of the life cycle, the amount of activity-productivity and the obtained results of elemental evaluation of types of intelligence, determining the reliability of the obtained research results by checking retested reliability and internal consistency (Cronbach's alpha coefficient). The article validates the choice of specific methods of assessing each type of employee intelligence based on the elements of the five-factor model. Application of the author's method was carried out at project departments of seven enterprises in the construction industry. The author's evaluation method was developed and tested for the purpose of further research in the influence of intelligence types of the five-factor model on the productivity of employees, taking into account the stages of their life cycle

**Keywords:** assessment tool, emotional intelligence, cognitive intelligence, social intelligence, physical intelligence, vitality quotient, employee life cycle

### INTRODUCTION

Contemporary operational conditions of enterprises in the VUCA environment (Volatility, Uncertainty, Complexity and Ambiguity) and the processes of constant transformation of the social and labour sphere pose new challenges to enterprise management. Research in recent years [1-3] increasingly proves that not only the professional skills of an employee are valuable for employers but other abilities and personal qualities play an important role in a person's professional activity. It is the system of socio-psychological

indicators and modern studies of the possibilities of human development in the professional sphere [4-6] that form the basis of effective motivational system.

In order to determine the main socio-psychological indicators that are key in shaping the productivity of an employee, scientists [7; 8] increasingly turn to the theory of multiple intelligences proposed by H. Gardner, in which the author suggested that the success of a person's life is determined not by the general type of intelligence, but by

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the multiplicity of its manifestation forms [7]. However, many contemporary researchers make their own corrections to the theory proposed by the author, simplifying or supplementing it with their own types of intelligence [9; 10].

In recent decades, the number of studies on the impact of certain types of intelligence on employee productivity has been increasing. One of the first researchers in this area was D. Goleman, who, by analysing professional lives of ninety-five graduates of Harvard University, using his own method of assessing the level of emotional intelligence (EQ), determined that the success of an employee depends on his knowledge (IQ), and 85% of success is determined by the employee's emotional intelligence [11]. The research conducted by him on the basis of more than 200 enterprises in different countries of the world confirmed that the difference in performance indicators for jobs (positions) of medium complexity is 67% dependent on the level of emotional intelligence of the employee (EQ), and only 33% on technical skills, professional knowledge, skills and cognitive abilities; and within top management, where the level of complexity is high, the impact of emotional intelligence is even greater and is 80%, while technical skills, skills and cognitive abilities constitute only 20% [11]. Confirmation of this theory is investigated in the works of a number of scientists [7; 12; 13].

Modern studies in the field of socialisation are increasingly focusing their attention on the study of social intelligence influence on the effectiveness of activities. The concept of "social intelligence" (SQ) was introduced by E. Thorndike in psychology in 1920, which the author defined as "activity in interpersonal relationships" [9]. In 1937, H. Allport singled out social abilities as individual personal qualities and properties in human activity and noted the high importance of the influence of this indicator on human life. In further studies of social intelligence, scientists [9; 14; 15] attribute the lion's share of research in the structure of intelligence to him. L.I. Uman defines social intelligence as practical thinking, giving it special importance in human activity [16]. In her research, M. Kubyshkina established a positive correlation between the level of social intelligence and high performance in interpersonal interaction [17]. E.Z. Ivashkevich identifies social adaptation and problem solving as the main function of intelligence [8].

With the introduction of the term "vitality quotient" (VQ) – the coefficient of vital energy, or, in other words, the ability to energise oneself and others, the opinions of scientists have somewhat changed. French psychologist Pierre Kass was one of the first to point out in his article in Forbes magazine that a high VQ is definitely more important than a high IQ or EQ, because it is the presence of vital energy that allows a person to develop other skills and competencies [10]. The coefficient of vital energy allows you to achieve your goals more effectively, while charging others with your enthusiasm [18]. However, it is worth noting that without a high level of IQ and EQ, it will be much more difficult to do this, because it is thanks to them that a person is able to manage, direct and distribute his own energy resources in accordance with the goals. It is important that

this indicator can be used not only at the individual level, but also at the level of teams, organisations, or at even more extent global level.

A number of scientists [19; 20] in their works note the importance of researching the level of physical intelligence (PQ) in various fields of activity. Although determining influence of PQ level, i.e., physical endurance and health of a person, on his productivity has always been obvious, today researches in the field of the influence of healthy behavior and physical activity on the quality of professional training and indicators of competitiveness are gaining special importance [19]. As noted by researchers L.O. Popov, V.M. Sokrut, G.L. Apanasenko and others, today medical science and society in general are beginning to realise that achieving an optimal level of health is not possible only by treating diseases, because "health is not only the absence of diseases, but it is also a state of complete well-being..." [21]. That is, outdated methods become not only ineffective, but also unpromising in achieving the main goal. Strengthening and preserving health of a person, and in our study, health of an employee, is an important task of the management system.

*The main goal of the article* is the development of tools for assessing types of employee intelligence, which form a system of key socio-psychological indicators.

## MATERIALS AND METHODS

In order to form a system of socio-psychological indicators, which are key in shaping employee performance, we used the author's five-factor model of employee intelligence, which links basic types of intelligence (EQ, IQ, SQ, VQ, PQ) with employee performance [22], and is based on the theory of multiple intelligences of G. Gardner. In order to form a qualitative system of social and psychological assessment, we made a selection among the existing methods of assessment of each type of intelligence of the five-factor model.

Among the wide selection of methods for evaluating the level of emotional intelligence (EQ), to date, the author's objective test of J. Mayer, P. Salovey and D. Caruso, which is used in modern research by many scientists, has become the most widespread. This technique was developed on the basis of the four-component structural model of abilities proposed by the authors, and includes two subtests for each component of emotional intelligence of the specified model, namely:

- perception, evaluation and expression of emotions (identification of emotions);
- the use of emotions to increase the efficiency of thinking;
- understanding and analysis of emotions;
- conscious management of emotions for personal growth and improvement of interpersonal relations [23].

It is also worth giving special importance to innovative technologies in the field of emotional intelligence, notably, emotional artificial intelligence, which, through awareness of one's own emotional abilities, contributes to the professional self-improvement of the employee [24].

The first researcher who proposed to study social intelligence (SQ) as an object of measurement was J. Gilford.

The author, together with M. O'Sullivan, developed a test for measuring social intelligence, which includes four subtests aimed at diagnosing four abilities in the structure of social intelligence: knowledge of classes, systems, transformations and behavioural results [25]. Today, this method of assessing the level of social intelligence is the most developed and accurate.

Several versions of tests for determining the level of vital energy (VQ) are available online today, but in practice, the author's method of Oksana Chekhova – HR expert and consultant on organisational development and personnel development – is used quite often. The proposed method consists of three parts: test questions, subjective assessment of the interviewee and solving mini cases [26].

In practical medicine, the system of assessing the level of physical health (PQ) is based on a general examination of a person and, in the absence of signs of disease or certain physical defects, a diagnosis of "healthy" is made. However, this method is too simplistic. In order to determine the level of physical health and its impact on employee productivity, we used the term "amount of health" proposed by M.M. Amosov. The author defines somatic health as a certain functional reserve that ensures the productivity of the functioning of all organs and systems, determines the speed of adaptation of the organism to environmental conditions, and can be measured by specific indicators or parameters [20].

A number of authors [27; 28] in their studies of assessment of working capacity and physical endurance use the term "physical development of a person", which is defined as a complex of morphological and functional properties of the body. Assessing the level of physical development of a person makes it possible to assess physical strength and endurance, productivity, volume and nature of physical exertion.

Many authors offer their own methods of assessing the level of health. P. Ramzaeva singles out four main criteria in the evaluation system: life expectancy; time integral of physical and mental capacity; the ability to reproduce healthy offspring; integral of well-being (over a lifetime) [29]. V. Zaitseva notes that physical health can be assessed with the help of tests, using the main five morphological and functional indicators: Quetelet index (level of mass and growth development); Robinson's index (quality of regulation of the cardiovascular system); Skybynskyi index (functional capabilities of respiratory and circulatory organs); Shapovalova index (level of development of motor qualities – strength, speed, endurance, as well as functional capabilities of the cardiorespiratory system); Ruffier index (level of adaptation reserves of the cardio-respiratory system) [30].

The majority of authors [31; 32] in the field of research on methods of assessing human physical development note that the most accurate and optimal in various fields of research are questionnaire and test methods of assessment. For this purpose, we have chosen the method of assessing the employee's physical health based on the method of determining biological age, proposed by E.L. Mykhalyuk et al. [33]. This technique consists of objective (anthropometric and functional indicators) and subjective (questionnaire data) assessment systems.

In order to evaluate the types of intelligence of employees according to the elements of the five-factor model, taking into account the stages of their life cycle, we have developed an appropriate method using existing methods. The author's method consists of three consecutive stages. At the first stage, individual types of intelligence of the five-factor model are assessed using the following methods:

1. The level of emotional intelligence (EQ) is determined using our adapted test MSCEIT V2.0 (J. Meyer et al.) [34]
2. Evaluation of the level of social intelligence (SQ) – using the test of J. Gilford & M. O'Sullivan [25].
3. Determination of the coefficient of vital energy (VQ) by the author's method of Oksana Chekhova [26].
4. Assessment of the level of physical intelligence (PQ) by the method of calculating biological age (E.L. Mykhalyuk et al.) [20; 33].

Determination of the level of cognitive intelligence (IQ) using one of the most researched and widespread methods – the classic test of the English psychologist H. Eysenck [35].

To simplify and unify test scores, it is suggested to use the system of dynamic walls from 1 to 9 [36]. At the second stage, using MS Excel software, the obtained test results are analysed and the relationship between the stages of the life cycle, the amount of activity-productivity and the obtained results of the element-by-element assessment of types of intelligence is established. At the third stage, the reliability of the obtained research results is determined by retesting and calculating the Cronbach's alpha correlation coefficient.

The proposed method was tested at project departments of seven enterprises in the construction industry. The research sample of the project department of enterprise A consisted of 14 employees, at enterprise B – 12 employees, at enterprise B – 9 people, at enterprise D – 19, at enterprise D – 17, at enterprise E – 14, at enterprise Z – 20 interviewed employees. In general, the sample consisted of 105 people. The surveyed employees passed five types of tests to determine their levels of IQ, EQ, VQ, PQ and SQ, respectively. In order to reduce the burden on the respondents, each test was conducted on a separate day, accordingly, the period of the conducted research was five days. To check the reliability of the obtained results, we conducted a repeated study in a month. The management of the enterprises provided the data on the number of projects completed by each employee within three months, including the period of the study.

## RESULTS AND DISCUSSION

Let's have a look at the results of the test of the proposed method.

**Stage I.** Application of the walls method for matching the results of element-by-element assessment of types of intelligence according to the five-factor model. The obtained results of the assessment of each type of intelligence of the five-factor model are translated into dynamic walls from 1 to 9, which are calculated by determining the minimum value from the range of received data ( $O_{min}$ ) and the maximum ( $O_{max}$ ). Next is the value  $\delta = (O_{max} - O_{min}) / 9$ . Values greater than  $O_{max}$  correspond to the 9<sup>th</sup> wall, values smaller than  $O_{min}$  correspond to the 1<sup>st</sup> wall, and between them there are other walls with a step [36] (Table 1-5).

**Table 1.** Results of transfer of points into IQ walls

Walls	1	2	3	4	5	6	7	8	9
Range	0-17	18-34	35-52	53-70	71-88	89-106	107-124	125-142	143-160

**Source:** developed by the authors based on [36]

**Table 2.** Results of transfer of points into EQ walls

Walls	1	2	3	4	5	6	7	8	9
Range	0-0.1	0.1-0.2	0.2-0.3	0.3-0.4	0.4-0.5	0.5-0.6	0.6-0.7	0.7-0.8	0.8-0.9

**Source:** developed by the authors based on [36]

**Table 3.** Results of transfer of points into SQ walls

Walls	1	2	3	4	5	6	7	8	9
Range	0-6	7-12	13-18	19-25	26-31	32-37	38-43	44-49	50-55

**Source:** developed by the authors based on [36]

**Table 4.** Results of transfer of points into PQ walls

Walls	1	2	3	4	5	6	7	8	9
Range	2.0-1.78	1.77-1.56	1.55-1.34	1.33-1.12	1.11-0.9	0.89-0.68-	0.67- 0.46	0.45-0.23-	0.22-0

**Source:** developed by the authors based on [36]

**Table 5.** Results of transfer of points into VQ walls

Walls	1	2	3	4	5	6	7	8	9
Range	0-0.1	0.1-0.2	0.2-0.3	0.3-0.4	0.4-0.5	0.5-0.6	0.6-0.7	0.7-0.8	0.8-0.9

**Source:** developed by the authors based on [36]

The obtained body of information ensures the comparability of the results of the assessment of various types of intelligence using various methods. Within our research, an important factor that must be taken into account is the periodisation of the employee's activity. Since each period in the employee's activity has different conditions, goals and motivation, accordingly, the impact of certain types of intelligence on the productivity of the activity will also be different. For this purpose, we have identified a number of main interdependent stages of the employee's life cycle [37], namely: hiring (first), socialisation (second), labour activity (third), training and evaluation (fourth), professional realisation and growth (fifth), dismissal (sixth). It is important to note that the defined cycle is repeated multiple times, except in cases of retirement or other reasons for termination of the employee's employment.

**Stage II.** Establishing a relationship between the stages of life cycle, the amount of activity-productivity and the obtained results of element-by-element assessment of types of intelligence according to the five-factor model in walls. In order to group and analyse the received body of information,

we created tables using MS Excel software. Using the sorting function of MS Excel software, we created data tables that represent the relationship between employees at a certain stage of their life cycle, their performance and the results of wall tests. At this stage, we evaluated six groups of employees who are at different stages of their life cycle. The number of employees in the first stage of the life cycle is 10, in the second – 20, in the third – 17, in the fourth – 21, in the fifth – 25 and in the last sixth stage – 12 employees.

Using function wizard as one of MS Excel software modules, the maximum (MAX) and minimum (MIN) value of the general sample productivity of employees was calculated, which is 1 unit and 14 units, respectively. The average value of activity-productivity (AVERAGE) of the total sample is 8 units. Also, using the AVERAGE function, the average value of indicators (productivity of activity; test results transferred to walls) was calculated for each group of employees, taking into account the stages of their life cycle.

Table 6 shows the average values of the obtained results of the study of the five-factor model of intelligence, taking into account the stages of the employee's life cycle.

**Table 6.** Average values of the results of the five-factor model of intelligence, taking into account the stages of the employee's life cycle

Life cycle stage	Group of employees, people	Productivity of activity	Types of intelligence according to the elements of the five-factor model, walls				
			IQ	EQ	SQ	PQ	VQ
First	10	5.80	6.30	6.60	5.40	5.40	5.90
Second	20	6.70	5.0	5.85	6.25	5.35	6.15
Third	17	6.47	5.59	5.71	5.53	6.35	5.12
Fourth	21	9.62	5.57	6.38	5.43	5.86	5.67
Fifth	25	9.20	6.52	6.32	5.28	5.44	5.64
Sixth	12	8.00	5.00	5.75	5.25	6.08	5.92

**Source:** designed by the authors using MS Excel software

The group of employees who are at the first stage of their life cycle, i.e. undergoing an internship, are on a probationary period, or have just moved to a new position, consists of 10 people and are characterised by a sufficiently high level of emotional and cognitive intelligence. The value of the levels of physical, social and energetic intelligences is at an average level in the range of 5.4-5.9. This stage is characterised by a high level of stress due to uncertainty and new working conditions. The performance of each worker in the group varies significantly, with a mean of 5.8, which is below the mean for the total sample.

The analysis of the results of testing of a sample of employees who were at the second stage of their life cycle, that is, they were undergoing a period of socialisation, shows high indicators of the level of vital energy and the level of socialisation. At this stage, adaptation of employees to the new team, familiarisation with new rules, ethics and etiquette takes place. It is worth noting that the level of activity productivity in the group of employees is higher than that of employees in the first stage of the life cycle, but it is lower than the average value of this indicator of the total studied sample.

The third stage of the life cycle is labour activity. According to the results of the study, all obtained indicators of the assessment of types of intelligence according to the elements of the five-factor model are above the average level, however, the highest value corresponds to the level of physical and emotional intelligence. Therefore, the basis of this stage of the life cycle is the fulfillment of labour obligations, which requires a high level of physical intelligence. The average value of the productivity of the group of employees, who are in the third stage of their life cycle, is also below the average value of this indicator of the total studied sample.

The group of employees who are at the fourth stage of their life cycle consists of 21 people and is characterised by a sufficiently high level of emotional intelligence. Also, among the studied sample of respondents, the activity-productivity index in this group of employees is the highest.

The largest number of people in the total studied sample belongs to the fifth group of employees and is 25 people. This group is characterised by a high level of emotional and cognitive intelligence, as well as a fairly high level of activity productivity, which is higher than the average value of the general studied sample.

The sixth stage is the final stage of the cycle. In this period of activity, employees are either at the stage of transition to the next cycle (promotion, change of place of work, type of activity, etc.), or at the stage of completion of labor activity (retirement, or other reasons). Some of the workers who are at the sixth stage of the life cycle have a rather low level of vital energy, which may indicate emotional burnout under the influence of a number of factors: work, social or psychological [27], dissatisfaction with the workplace, or a desire to end work. That group of employees, for whom the level of vital energy remains high, are at the stage of transition to the next cycle, i.e., promotion, change of workplace, etc. Such a sample of employees is characterised by a sufficiently high level of physical development and vital energy. The average indicator of the performance of the studied sample at this stage coincides with the average value of the general sample.

**Stage III.** Checking retested results proving reliability of the method. In order to check the reliability of the obtained results, we conducted a repeated study a month later. The obtained results of retested reliability studies are shown in Table 7.

**Table 7.** Value of r-Pearson correlation coefficients of retested reliability indicators

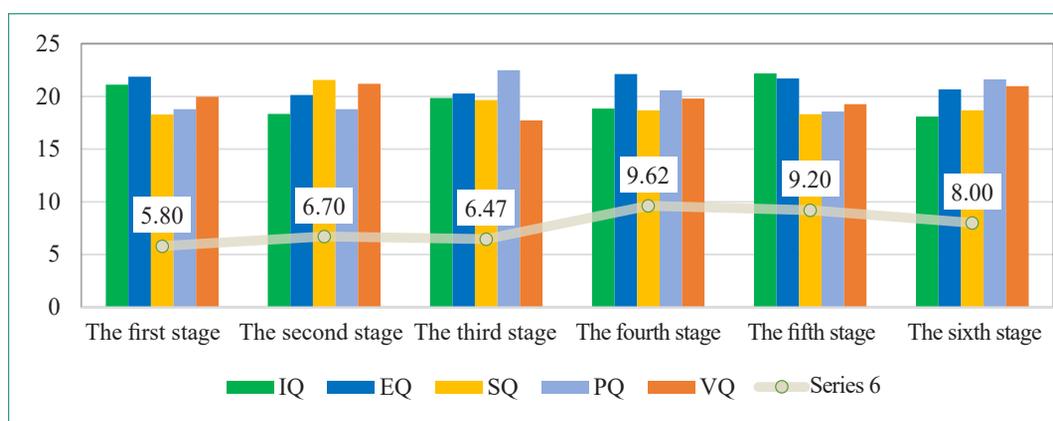
Life cycle stage	Correlation coefficient (r)					Level of significance(p)				
	IQ	EQ	SQ	PQ	VQ	IQ	EQ	SQ	PQ	VQ
First	0.70	0.88	0.91	0.90	0.78	0.01	0.01	0.01	0.01	0.01
Second	0.84	0.76	0.83	0.86	0.91	0.01	0.05	0.01	0.01	0.01
Third	0.68	0.87	0.77	0.69	0.88	0.01	0.01	0.01	0.01	0.01
Fourth	0.81	0.80	0.74	0.88	0.69	0.01	0.01	0.01	0.05	0.01
Fifth	0.84	0.72	0.89	0.80	0.74	0.01	0.01	0.01	0.01	0.01
Sixth	0.73	0.69	0.83	0.78	0.83	0.01	0.05	0.01	0.01	0.01
Cronbach's alpha coefficient	0.91	0.89	0.96	0.94	0.9	-	-	-	-	-

**Source:** designed by authors

Based on the obtained data, it was established that the results of the study are characterised by high reliability, since the range of values of r-Pearson correlation coefficients when assessing retested reliability at individual stages of the life cycle is in the range of 0.68-0.91. The obtained indicators of the Cronbach alpha correlation reliability coefficient

are in the range of 0.89-0.97, which also confirms the high reliability of the obtained research results.

Figure 1 shows the dynamics of the values of the types of intelligence according to the elements of the five-factor model in walls and the productivity of groups of employees, taking into account the stages of their life cycle.



**Figure 1.** The dynamics of the values of the types of intelligence according to the elements of the five-factor model, expressed in walls, and the productivity of the activities of groups of employees, taking into account the stages of their life cycle

**Source:** designed by authors

The given graph makes it possible to clearly track the significant increase in the productivity of activities in the fourth and fifth stages of the life cycle. The fourth stage of the life cycle corresponds to the period of training and evaluation of employees, a high level of activity-productivity indicates high motivation of employees at this stage, since the results of the employees' activities will affect the results of their certification. The high level of activity productivity at the fifth stage of professional realisation and growth is justified by the improvement of the level of qualifications of employees. Also, at the specified stages of the life cycle, a high level of emotional literacy and cognitive intelligence is observed (Table 6).

So, as a result of the conducted research, the author's method of assessing the types of intelligence of the employee according to the elements of the five-factor model is proposed. Unlike the existing ones, the proposed method provides a comprehensive approach to the formation of data for making management decisions. Based on the results of the study, the priority types of employee intelligence at each stage of the life cycle were identified, which should be paid attention to by the management of enterprises when planning labour productivity.

## CONCLUSIONS

Today, the influence of socio-psychological factors on the productivity of employees is of leading importance. That is why theoretical-methodical and practical studies provide the management of enterprises with the tools necessary for successful functioning of the business. Developed as a result of our research, the tool for evaluating the types of employee intelligence based on the elements of the five-factor model,

taking into account the stages of their life cycle, will allow the management of enterprises to apply socio-psychological management methods on a scientific basis.

The developed method is complex in nature and requires compliance with a certain algorithm of actions. As a result of approbation of the proposed method at the first stage with the help of the method of dynamic walls, a system of unified evaluation data of the five-factor model was obtained for individual types of intelligence of employees in walls. At the second stage of the proposed evaluation method, the relationship between the value of activity-productivity and the average values of the obtained results of elemental evaluation of the types of intelligence of groups of employees at different stages of their life cycle was investigated. It is important to note that employees who are at the stages of training and professional realisation are characterised by the highest level of productivity and high indicators of the level of emotional intelligence, which indicates the interrelation of these indicators at these periods of the life cycle. The values of the r-Pearson correlation coefficients obtained at the third stage in the assessment of retested reliability and Cronbach's alpha correlation coefficient indicators confirmed the high reliability of the obtained research results.

The dynamics of the obtained indicators made it possible to establish the priority types of intelligence of employees at each stage of their life cycle, which should be paid attention to by the management of enterprises when making management decisions. The purpose of further research is to establish the influence of types of intelligence according to the elements of the five-factor model on the productivity of employees, taking into account the stages of their life cycle.

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## Метод оцінки видів інтелекту працівників за елементами п'ятифакторної моделі з урахуванням етапів життєвого циклу

**Анотація.** Умови функціонування підприємств в середовищі VUCA (Volatility, Uncertainty, Complexity and Ambiguity) характеризуються радикальними змінами у соціально-економічній сфері, нестабільністю та високим рівнем стресовості. Усе більша кількість наукових досліджень підтверджують значний вплив соціально-психологічних факторів на продуктивність діяльності працівника, тому перед керівництвом підприємства постає завдання їх ефективного оцінювання. Метою статті є розробка інструментів оцінки системи соціально-психологічних показників, заснованої на множинності форм прояву інтелекту працівника. В статті представлено авторський метод оцінки видів інтелекту працівників за елементами п'ятифакторної моделі з урахуванням етапів їх життєвого циклу. Запропонований метод складається із трьох послідовних етапів: узгодження результатів застосування методик оцінювання кожного елементу п'ятифакторної моделі інтелекту працівника із застосуванням методу стенив; встановлення зв'язку між етапами життєвого циклу, величиною продуктивності діяльності та отриманими результатами поелементного оцінювання видів інтелекту; визначення надійності отриманих результатів дослідження шляхом перевірки ретестової надійності та внутрішньої узгодженості (коефіцієнт альфа Кронбаха). У статті обґрунтовано вибір конкретних методик оцінки кожного виду інтелекту працівника за елементами п'ятифакторної моделі. Апробація авторського методу проводилась на базі проектних відділів семи підприємств будівельної галузі. Авторський метод оцінки розроблено та апробовано з метою подальших досліджень впливу видів інтелекту п'ятифакторної моделі на продуктивність діяльності працівників з урахуванням етапів їх життєвого циклу

**Ключові слова:** інструмент оцінки, емоційний інтелект, когнітивний інтелект, соціальний інтелект, фізичний інтелект, коефіцієнт життєвої енергії, життєвий цикл працівника

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## Improvement of Event Management Positioning in Enterprise Management

**Abstract.** Tendencies of conducting business in the 21<sup>st</sup> century created the need to transform conventional approaches in management seeking opportunities for implementing new effective management tools for various aspects of production and economic activity. Recently, event management has become one of the most dynamic subsystems of enterprise management functioning in parallel with other subsystems (in particular, subsystems of financial management, production management, quality management, personnel management, innovation management, management of foreign economic activities, information management, risk management, project management, etc.). The pace of event industry development is increasing every year, both in Ukraine and worldwide. Today, it is difficult to imagine existence of any business sphere without the tools and methods of various business event management initiatives (business meetings, fairs, exhibitions, conferences, congresses, marketing events, social initiatives, etc.), as well as without teambuilding character of activities at economic entities, encompassed in the concept of event management. At the same time, giving its low coverage in literature, the issue of event management positioning in the enterprise management leads to the creation of various problems: it becomes difficult to determine its optimal structure depending on the type of business, its role in ensuring development of a business entity is “blurred”, its significance in creating added business value is underestimated, etc. The purpose of this article is to develop a model for positioning event management in company management, looking at it from a two dimensional perspective: focusing on processes and focusing on the future, depending on the level of event management integration into the overall management system in a company. To achieve the set goal, a systematic approach, a graphic display method, as well as a structural and logical analysis were used. The proposed model adds value to the list of scientific and practical provisions in event management sphere, as it makes it possible to unfold its deep essence and structure, which are instrumental for the realities of modern businesses, and to determine its connection with other management subsystems through the prism of “value for others”. In addition, the given proposals contribute to the understanding of event management as a system-forming component in increasing business efficiency. Finally, the specified model will help to increase profitability of enterprise by integrating divisions involved in event management processes. It is about event management at its highest levels of development contributing to the creation of actual added business value

**Keywords:** teambuilding, business, business meetings, events, leisure, event planning

### INTRODUCTION

Positioning of event management in enterprise management is one of the most complex modern practiced tasks in the process of forming and improving this type of management in the organisation. If the formation of event management takes place according to the principle “from scratch”,

the situation is in many ways more definite, because then it is obvious that everything should start with the construction of a foundation and a base for managing business and team-building practices within the activities of economic entities, and then vacant categories are to be filled with

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constituent elements. In the case when event management already exists at an enterprise in one form or the other, it becomes more difficult to carry out practices for its development, as then it is often necessary to resort to measures of restructuring nature. In any case, in order to understand the most expedient directions in event management development, it is necessary, first of all, to determine its positioning in overall enterprise management, specifying its place in such management (current and prospective).

The positioning of event management in enterprise management should be considered a complex practical task, but without its solution it is difficult to ensure the effectiveness of formation and usage of this type of management in the organisation. As is known from theory and practice, traditional models of using and improving various types of management at enterprises usually require significant effort. This is especially characteristic of such a relatively new management subsystem as event management. Without a preliminary assessment of the state and role of event management in overall enterprise management, it is quite difficult to transform its structure or introduce radical changes in this direction. This requires serious efforts from both individual departments and the company as a whole, as well as sizeable costs. In order to optimise these processes, one should possess information about the current state of event management and identify alternative options for further actions in the direction of its development in the organisation. At the same time, it will be useful and practically significant to develop a model for positioning event management in enterprise management.

A large number of researchers and scientists have been engaged in the study of issues of implementation and improvement of event management processes at enterprises. Since event management is still a fairly new and not fully studied subject in Ukraine, a significant number of discoveries in this sphere have mostly been made by foreign specialists. Scientists such as B. Aldebert, A. Pascal, A. Rouziès [1] and C. Bladen [2] made a huge contribution to the study of the issues of revealing the place of event management in enterprise management. They found that event management helps to optimise many other management processes, including financial and investment ones. Such specialists as D. Getz [3-5] and M. Niekerk [6], M. Schnitzer, C. Kössler, P. Schlemmer, and M. Peters [7] found out that the inadequacy and lack of structure in the mechanisms for the implementation of event management policy subsequently does not allow to determine specific optimal directions for the realisation of event management. D. Ulrich, J. Younger [8-10] and D. Kryscynski [11] investigated the problems of competence, role hierarchy and the positioner's role in the company. Scientists have determined the exceptional influence of the competence of the top management on the formation of clear motivation in the staff to strengthen their positions focused on development. The problems of organisational support for the implementation of event management were described by J.R. Silvers [12], V. Smith [13], W. Stam [14] and G.T.H. Vu [15]. The

researchers found out that simultaneous subordination of employees from different departments to both, the company CEO and Event Manager, regarding the implementation of event management, leads to misunderstandings and disruptions in activities. Among the domestic authors who conducted research in the field of event management, the works of O. Kuzmin et al. and M. Golovan [16; 17] and V. Mysyk [18; 19] must be mentioned. They investigated the problems of implementing event management and its development in the organisation, in particular, they identified a number of key problems in the competence of employees involved in event management, and also established the relationship between event management and other management areas (financial management, marketing, HR management, innovation management, etc.). At the same time, we consider it worth mentioning, that scientific literature at the current stage of event management development does not contain an adequate model of positioning event management in enterprise management, which opens up opportunities for researching this problem.

*The purpose of the study* is to develop a model for positioning event management in the management of enterprises, which will enable advancement and optimisation of its formation processes and development, and in the future will contribute to increasing the profitability of business entities.

## MATERIALS AND METHODS

On the basis of general methods of research, institutional and innovative, theoretical and methodological aspects of the positioning of event management in the management of enterprises were investigated. The institutional methodological approach to the study of the theoretical foundations of the event management positioning model is based on its exceptionally important socio-economic significance for enterprise management in the modern progressive information and technological society. A new approach is used to identify prospects for using this event management positioning model as an innovative technique for improving event management processes at enterprises and increasing its efficiency and effectiveness.

A graphic display method and structural-logical analysis were used in the research process. With the help of graphic display, drawings of the event management positioning model in enterprise management were designed, which allows to visually depict the roles and directions of expert work in event management positioning. Thanks to the structural and logical analysis, logical connections between separate areas of expert work on the positioning of event management in enterprise management were investigated and formed, and their structuring was carried out.

## RESULTS AND DISCUSSION

In recent years, the issue of effective implementation of event management has been considered by a large number of scientists [12; 14; 15]. In particular, W. Smith [13] put forward the assumption that organisational support for its implementation should be at the forefront in the process

of event management formation. A flexible organisational structure and clearly defined roles of event management participants will allow the event management process to become stable, efficient and highly effective.

In his scientific articles, M. Schnitzer [7] draws attention to the problem of specifying the areas of event management implementation, as well as choosing the most promising among them for each individual enterprise, depending on various factors. This matter is currently one of the key issues and requires attention of management personnel involved in event management in the company.

H. Pino [20] and colleagues drew attention to the methodological basis for evaluating event management strategies in relation to social media. The authors rightly noted that today media platforms and online communications play a decisive role in all management processes, including event management. Since event management is one of the most interactive areas, which today has largely been transformed into online event management, the role of social networks and their influence on the implementation of event management cannot be underestimated. In particular, a large number of projects can be carried out in the form of online communications and video communication, which significantly changes the management toolkit.

D. Getz [3-5] proposed to use event portfolio management system, which will select scenarios of pre-created event plots or, based on experience of implemented events, to create the ideal structure of the event according to certain criteria. D. Getz believes that the process of event management can be optimised using the function of the so-called “library” of event subjects and event projects to save time and resources.

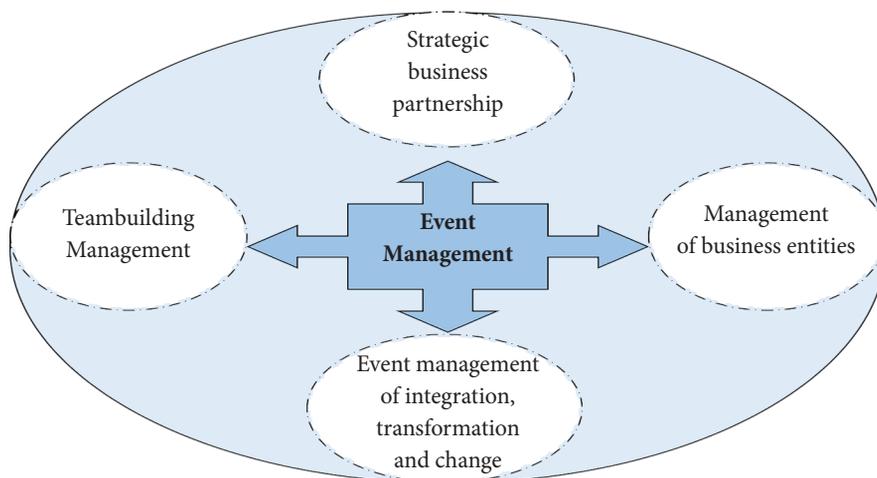
D. Ulrich and J. Younger in their works [9-11] appropriately highlighted the importance of personnel management positioning and the positioner’s role in

enterprise management. Scientists described the importance of positioning as a new method of managing possible strategic directions of enterprise activity. The developments of these scientists were mainly aimed at working with personnel on the role of a positioner in the management of labour resources [8]. However, after analysing his scientific research, we can conclude that positioning is not limited to personnel management. In event management, as an innovative and promising field, it is appropriate to use elements of positioning at various stages of its development, starting from its origin and formation and ending with its transformation, integration or even liquidation. A model of event management positioning in enterprise management has not yet been formed, although we believe that the issue of event management positioning is relevant and promising.

The event management positioning model in enterprise management makes it possible to determine its optimal structure depending on the type of business, to carry out the decomposition of its functions, to identify its role in ensuring business entity development, as well as to describe the roles of employees in this direction. In the final result, the specified model will help to increase the profitability of the enterprise by integrating the divisions that are involved in event management processes. It is about event management at the highest levels of its development contributing to the formation of actual added business value.

In the proposed model of event management positioning in enterprise management (Fig. 1), it is worth highlighting 4 of its defining roles:

- management of team building processes;
- management of business activities;
- strategic business partnership;
- event management of integration, transformation and change.



**Figure 1.** Event management positioning model in enterprise management

**Source:** suggested by the author

Each of selected roles shows a different dimension in the integration of event management into enterprise management. If the management of the business entity sees in event management only the implementation

of its so-called “basic” roles – management of team building processes and management of business activities – it is worth talking about focusing the attention of managers on processes. On the other hand, if event management is

related to the fulfillment of the roles of integration, transformation and change, as well as strategic business partnership in the activities of the business entity, it focuses on the future (a higher level of integration into the management system).

Each of the individual components of the event management positioning model in enterprise management has its own characteristics, as well as its own direction of expert work in the context of the formation and use of the organisational structure of management (Table 1).

**Table 1.** Characteristics of components of the event management positioning model in enterprise management

No.	Roles	Areas of expert work	Characteristics of roles and expert work
1	Teambuilding Management	Consultant in teambuilding area of event management	Studying the needs of the staff, creating conditions for increasing the potential and activity of the team, ensuring the full development of each team member, developing a program and holding team-building events, stimulating the staff, ensuring the maintenance and improvement of employee motivation for career growth and development within the company, etc.
2	Management of business entities	Centre for conducting business events	Creation of a management system for business trips, provisions for a quick feedback to people on business trips, preparation of all necessary documents within the scope of business events, assessment of the company's opportunities to participate in business trips, search for new opportunities and needs of business contacts, development of long-term and short-term plans and schedules of business trips, determination of trends regarding the types of business trips that will be most appropriate for the company in the context of the stage of its life cycle and the state of the market situation, search and adoption of optimal decisions regarding the involvement of certain employees in participation in business activities, etc.
3	Strategic business partnership	Strategic business development expert	Development of business strategy, event policy and procedures to achieve established company goals with the help of event management. Analysis of the general state of the event business, the adequacy of tasks and their compliance with the company's goals in general. Making decisions that ensure the creation of competitive advantages in the market and maintaining positions, expanding opportunities and increasing profits in the long-term perspective using event management tools and techniques
4	Event management of integration, transformation and change	Event integration, transformation and change expert	By using event management, building a system of complementarity of management processes with the combination and replacement of certain functions of organizational divisions, integration of event management into the work of all divisions, optimization of the work of divisions and ensuring a quick response to changes in the internal and external environment, transformation of approaches to the performance of certain tasks and functions, including marketing units (using event marketing elements), personnel management, production units, etc.

**Note:** selected by the author

The role of event management as a strategic business partner is primarily related to an objective assessment of the environment, on the basis of which organisational goals will be formed and decisions will be made on how to use event management in the process of managing the organisation. Having understood the general purpose of the organisation, within structural component of event management, taking into account the established goals, a strategic analysis of the external and internal environment is carried out, forecasts of the company's activity are made using event management, the advantages of using specific management methods are evaluated, the need for organisational changes is determined, and also the existing goals of the organisation are adjusted and new ones are identified based on the results of the analysis. In addition, a systematic analysis of all event

processes is carried out and an event management strategy is determined – strategic plans, strategic programs and strategic projects in this direction are drawn up, and indicators and criteria for its strategic control are identified. In light of this role, one should provide support, clarification and be involved in the processes of forming the company's strategic goals and objectives, as well as short-term goals and budgets.

Event management of integration, transformation and change makes it possible to build an optimal work process, ensure complementarity and interchangeability of organisational divisions, as well as integration of event management into each link of the organisational structure of management to ensure increased efficiency of management activities. In this context, it is also worth talking

about making changes to the powers and functions of specific players and units, constant monitoring of changes in the environment and the search for novelties, communication between units and uninterrupted information exchange processes, prompt changes and reactions to the needs of the internal and external environment, etc. [7; 14].

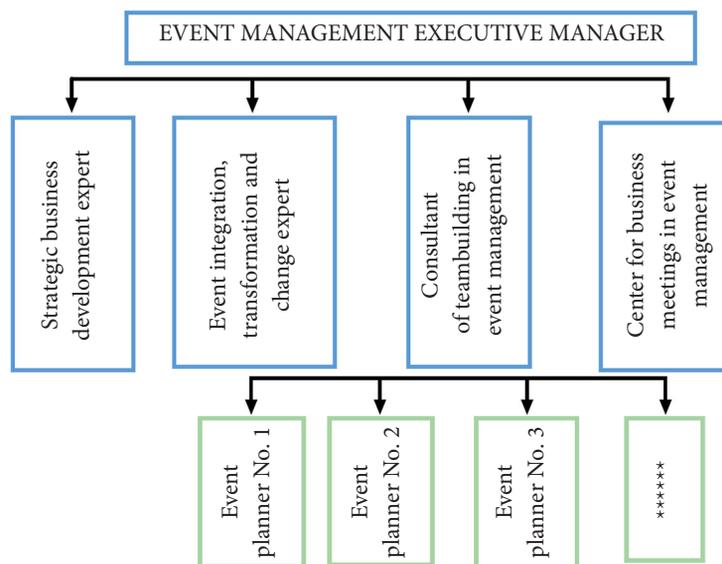
The management of team building processes is focused on motivating the performers to achieve organisational goals, stimulating this, as well as studying the needs of employees' preferences and reactions to certain activities. This role of event management is also connected with the application of team building and team support methods for the formation of a favourable organisational culture, ensuring a friendly atmosphere in the team and healthy competition, supporting team spirit, creating conditions for energy and moral reset, motivating the team to improve their abilities and productivity at work, creation of more themes and activities to unite the team and bring team members together, etc. Also, thanks to the management component of team building processes, prerequisites for supporting staff in a morally and physically healthy form are created. It is about determining the need for specific measures to improve the health and invigorate the activities of employees and divisions, analysing each division separately and employees in general, finding common interests and implementing activities for the team, implementing elements of rest, measures to increase interest in the performance of functional duties and relationships, motivating employees for future work, etc.

The role of business event management in the event management positioning model in enterprise management is also associated with a wide range of activities. In particular, in this context, it is worth talking about planning and organising business trips, studying the needs of employees and the market in business contacts, drawing up business itineraries and business maps, studying the opportunities of the industry and offers on the market of business meetings. Particular attention should be paid to the identification of business activities that are necessary for maintaining and developing relations between the enterprise and various groups of stakeholders. It is necessary to evaluate the effectiveness of the methods of holding business meetings and to determine the effectiveness of the latter. Within the areas of expert work of the enterprise's business events center, the search for popular events for business communication (exhibitions, forums, conferences, etc.) is carried out, its own business events are organised, and full support is provided to employees participating in them providing support and communication in language, transport issues, visa issues, etc. The event management positioning model in enterprise management can be applied to various types of enterprises, regardless of their field of activity and size. It makes it easier to understand the structure of event management, and also makes it possible to clearly distinguish the functional powers of employees involved in these processes.

The applied value of the developed event management positioning model in enterprise management is that it enables managers and business owners to expand their horizons and interpret event management not as a separate subsystem of management, but as a system-forming component in increasing business efficiency. Understanding this, the management of the business entity can model development of value of event management in their organisation: having a real assessment of the trends and prospects for the development of business environment, as well as being aware of the needs and expectations of stakeholders, the prerequisites are created for the formation of an effective event management system with clearly structured processes and effective tools. Thus, event management will make a significant contribution to the success of the company on the market and to ensuring its long-term development.

The proposed model of event management positioning in enterprise management enables management to change the logic of their own thoughts and interpret this type of management through the prism of "value for others" (for example, how the event management toolkit contributes to the improvement of supply, implementation and sales processes in the organisation, what value it adds that contributes to personnel management processes, how it helps to realise the mission and goals, etc.). Therefore, in the future, the effectiveness of event management can be determined by its qualitative and quantitative assessments by the so-called external stakeholders – to what extent event management helps them (for example, the department of foreign economic activity, the director of marketing and logistics, the internal audit sector, etc.) to fulfill their functional responsibilities and achieve key performance indicators.

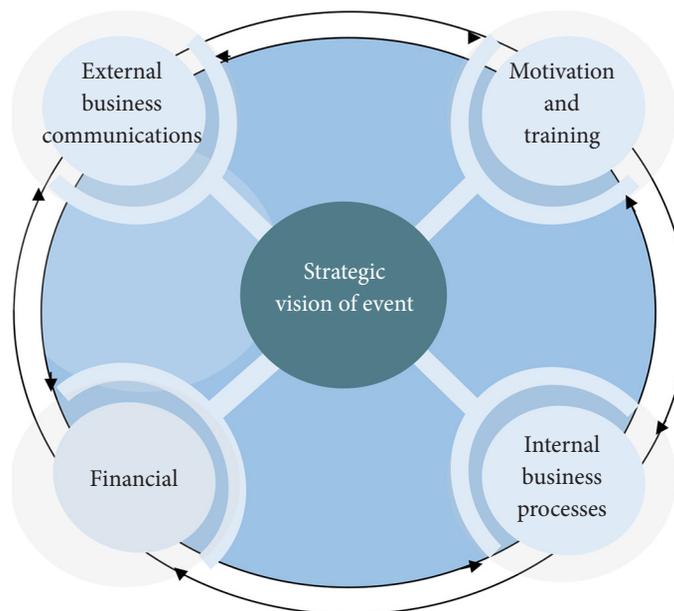
Forming the structure of event management in the organisation through the prism of understanding its possible roles, managers and owners are able to build the corresponding organisational management structure. In particular, it is obvious that each role in Table 1 can be assigned to a separate department or to a separate official in the organisation – and this is associated with a certain hierarchy of roles (Fig. 2). For example, the executive director of event management can act as a representative of the highest level of management, carrying out general management of event management processes at the enterprise. In the middle echelon there can be experts from each specific area of event management – an expert in strategic business development, an expert in event transformation, event integration and changes, a consultant in the team building area of event management, and the head of the event management center for business events. Depending on the size of the company, they may be subordinated to a certain number of lower-level managers who are directly involved in the implementation of event management activities in a specific direction. For example, the team building direction of event management often requires several event coordinators and event planners.



**Figure 2.** A fragment of a possible hierarchy of event management roles in the organisational management structure  
**Source:** suggested by the author

The effective positioning of event management in enterprise management is related to options for its strategic vision

on the part of managers and business owners. In this context, it is worth highlighting four directions of such a vision (Fig. 3).



**Figure 3.** Model of the strategic vision of event management at the enterprise  
**Source:** suggested by the author

For the optimality, effectiveness and balance of event management, managers and owners should pay attention to all areas of strategic vision of event management. If it is impossible to implement all directions in the practical activity of the business entity, as an option, it is appropriate to single out an element that will be of decisive importance in the implementation of the organisation’s strategy, or an element that is the least developed in the enterprise and requires more attention and effort.

The proposed structure of the strategic vision of event management at the enterprise outlines the strategically important spheres of influence of this type of management and the cause-and-effect relationships between them. For example, balanced internal business processes contribute to the creation of an optimal environment for personnel development, in particular, to the formation of effective motives for employees to continue working in this particular company, to reach new heights, to learn and improve [18].

Satisfied and highly qualified personnel have wider opportunities for effective external business communications – professionals are easy to trust and can be relied on in partnership and client relations. External business communications – exhibitions, forums, meetings, etc. – help to establish relations with market participants and create a positive image, which, in turn, contributes to financial success [3; 19].

The model shown in Figure 3 is bilateral, so it also works in the opposite direction. Financial success is based on maximising financial income and increasing the company's profit due to the use of event management in its activities. It contributes to the expansion of opportunities for business communications in the external environment. In turn, the opportunity to travel, attend conferences and meet famous personalities motivates staff to be active at work, as well as to learn and develop to meet the demands of modern business environment. Motivated and professional staff ensures the coherence and efficiency of business processes,

and the efficiency and effectiveness of business processes, in turn, is the foundation for financial success.

Focusing attention on processes within the given model of event management positioning in enterprise management necessitates careful planning of each specific event, regardless of its scale. It should be emphasised that events as such quite often have a project nature, therefore, have all the features of the project, including the position of managing them. In this context and taking into account the results of the study of theory and practice, it is advisable to emphasise that the process of event planning is cyclical, which is shown in Figure 4. Understanding the content of each of the stages makes it possible to more effectively perform the tasks that arise (for example, regarding the definition of goals and key indicators of the event, identification of the most significant risks, formation of the planned budget, involvement of personnel potential in the implementation of the event, etc.).

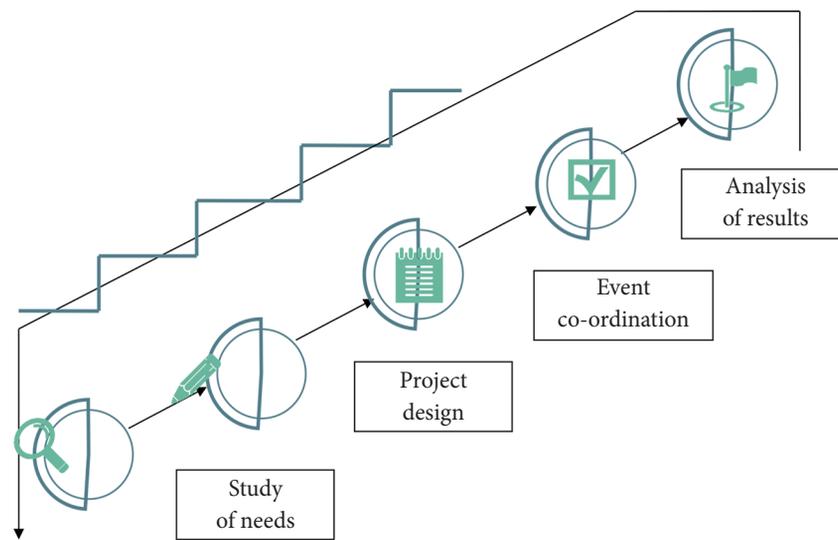


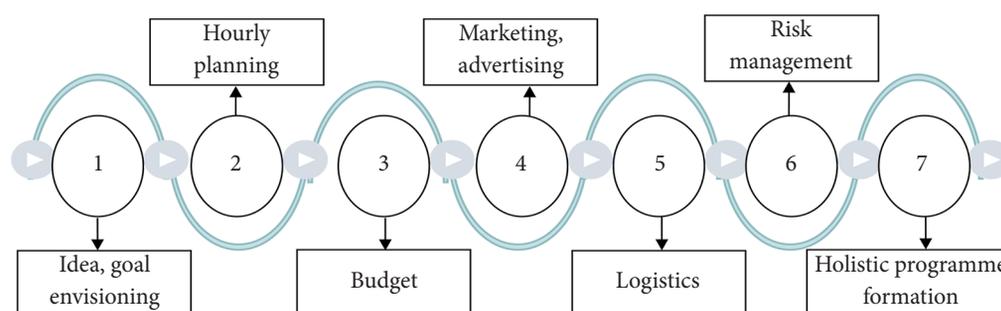
Figure 4. General stages of event planning

Source: suggested by the author

At the study of needs stage, units or individual officials study, evaluate and analyse the environment, the requirements it dictates for the implementation of the event, as well as market features. Internal research in this perspective consists in reviewing the data collected by the company in the process of acquiring its own experience and its careful interpretation.

Project design is one of the most creative stages of event planning. The project is designed in accordance with each specific situation and current goals of the company. Everything starts with the idea and vision of the project. The goals that the specified project will help to achieve are being set. Time planning is carried out – when will the most optimal time to hold the event be, how long this event will

take and what time reserves should be invested in the project plan. Having decided exactly what the project will cover, what elements will be included in the event and aligning them with the goals, an assessment and cost analysis is carried out, as well as the project budget is drawn up. To maximise the effect of the event, one should not forget about the marketing, and especially the advertising component of event planning – depending on the budget, goals and other factors, the most adequate marketing and advertising option is chosen. After that, planning of event logistics and assessment of all possible risks is carried out. Eventually, the final integrated program of the event is formed, taking into account all factors. In the time perspective, the stage of creating the design of the event project is presented in Figure 5.



**Figure 5.** Timeline of the stages of event project design

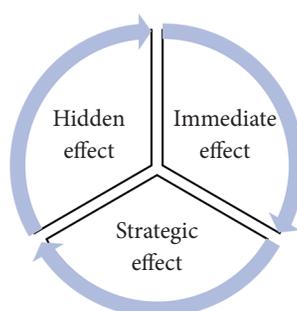
**Source:** suggested by the author

After creating project design, the event is implemented and coordinated. In the course of this, there is constant monitoring and control over the process, adjustments are also made as needed, and operational decisions are made in real time. People involved in the coordination process must have sufficient experience, because often unexpected situations and force majeure occur during the event, which require urgent intervention and quick response. In view of this, it is clear that a person who has already encountered similar scenarios can apply the most correct solution effectively, both for the organisation and for a specific event [12].

At the last stage, the results after the event are summarised and analysed, and information is collected from the participants of the process. It is important to get objective feedback from all categories of participants – both organisers and coordinators, and the target audience. This can be done with the help of reporting, questionnaires and surveys,

which are now carried out quickly thanks to the developed system of online communications, the Internet and social networks. Participants can submit results anonymously, which will increase the number of people who are ready to give feedback. Results are also evaluated according to all financial, social, cultural and other indicators [18].

Determining the effectiveness of events is important when focusing attention on processes or on the future within the given model of event management positioning in enterprise management. From a scientific point of view, this task is not an easy one, because it requires an unambiguous assessment of the impact of event management measures on the situation in the organisation from different angles. Often this influence is calculated for the future, so its effect is unevenly distributed over time. In any case, based on the results of the research, it is worth emphasising three key types of effects within event management – immediate, strategic and hidden (Fig. 6).



**Figure 5.** Key types of effects in event management

**Source:** selected by the author

After carrying out certain events within the framework of event management, the company receives an immediate effect almost instantly. Often it is short-term but most noticeable at first glance. In addition to the immediate effect, there is also a strategic effect that ensures the achievement of the long-term goals of the business entity, aimed at maximising the results of its activity in general. The third component of the effectiveness of event management is a hidden effect, which is reflected in more motivated staff, increasing their abilities, etc., which in the process will secretly

contribute to the development of the company and individual departments.

The evaluation of the effectiveness of event management should be carried out collectively by the management of the enterprise, event managers and other specialists in order to obtain an adequate and objective assessment.

## CONCLUSIONS

To summarise, it should be noted that the use of the proposed event management positioning model in

the management of enterprises will contribute to the optimisation and acceleration of diagnostic processes, evaluation of effectiveness and transformation of this type of management, in particular to the improvement of smoothness and clarity of planning processes, organisation, motivation, control and regulation. The model enables business owners and enterprise managers to expand their own horizons and interpret event management as a system-forming component of increasing business efficiency, rather than as a separate management subsystem. Contributing to the establishment of clear roles for employees involved

in event management processes, the identification of the goals and objectives of each specific enterprise depending on its size, field of activity and stage of the life cycle, as well as stimulation of employees, the proposed positioning model will become an indispensable tool in the activities of every modern enterprise, opening opportunities for further research into the roles and areas of expert work in event management.

Prospects for further research in this direction should consist in testing of the specified model in the activities of various business entities.

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## Удосконалення позиціонування івент-менеджменту в управлінні підприємством

**Анотація.** Особливості ведення бізнесу у XXI столітті зумовили потребу у трансформуванні традиційних підходів до управління та пошуку можливостей впровадження нових дієвих управлінських інструментів, які стосуються різних аспектів виробничо-господарської діяльності. Останнім часом однією із найбільш динамічних підсистем управління на підприємствах є підсистема івент-менеджменту, яка функціонує поряд із іншими такими підсистемами (зокрема, підсистемами фінансового менеджменту, виробничого менеджменту, менеджменту якості, менеджменту персоналу, інноваційного менеджменту, менеджменту зовнішньоекономічної діяльності, інформаційного менеджменту, ризик-менеджменту, проектного менеджменту тощо). Темпи розвитку івент-індустрії з кожним роком зростають як в Україні, так і в світі. Сьогодні складно уявити існування будь-якої сфери бізнесу без використання інструментів і методів управління різними заходами ділового (ділові зустрічі, ярмарки, виставки, конференції, конгреси, маркетингові заходи, соціальні ініціативи тощо) і тімблдингового характеру у діяльності суб'єктів господарювання, що охоплено поняттям івент-менеджменту. Водночас, на низькому рівні у літературі розглянуто проблему позиціонування івент-менеджменту в управлінні підприємством, що призводить до існування різних проблем: ускладнюється визначення його оптимальної структури залежно від виду бізнесу, «розмиваються» його ролі для забезпечення розвитку суб'єкта господарювання, нівелюється його цінність у створенні доданої вартості бізнесу тощо. Метою статті є розробка моделі позиціонування івент-менеджменту в управлінні компанією, у якій цей вид менеджменту розглядається у двох площинах: фокус на процесах та фокус на майбутньому залежно від рівня його інтегрування в систему управління. Для досягнення окресленої мети використано системний підхід, метод графічного відображення, а також структурно-логічний аналіз. Запропонована модель додає цінності у перелік науково-практичних положень у сфері івент-менеджменту, адже дає змогу розкрити його глибинну сутність та структуру у реаліях сучасного бізнесу, а також обґрунтувати його зв'язок з іншими підсистемами управління крізь призму «цінності для інших». Крім того, наведені пропозиції сприяють розумінню івент-менеджменту як системоутворюючої складової підвищення ефективності ведення бізнесу. У кінцевому результаті зазначена модель сприятиме підвищенню прибутковості підприємства шляхом інтеграції підрозділів, які залучені до процесів івент-менеджменту. Мова йде про те, щоб івент-менеджмент на вищих рівнях свого розвитку сприяв формуванню реальної доданої вартості бізнесу

**Ключові слова:** тімблдинг, бізнес, бізнес зустрічі, заходи, дозвілля, планування івентів

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## The Role of Occupational Safety Management at Enterprises and the Factors Contributing to its Unsatisfactory Condition

**Abstract.** The relevance of the researched problem lies in the fact that today industrial injuries and accidents at workplace are a fairly common problem. Since lives and health of employees, as well as production process efficiency, depend on ensuring workplace safety, occupational safety management becomes an important and integral component of industrial health and safety. The management of enterprises should be guided by the principle of life and health of employees being the most important value. There are certain methods of occupational safety management, such as economic, organisational, administrative-legal and social-psychological, which enable to create safe conditions at workplace. With their help, safe working conditions can be significantly improved and therefore efficiency of production process can be increased. In this regard, this article is aimed at defining the concept of occupational safety as an essential element of industrial health and safety. It also taps into the main components that make up an integrated occupational safety system and methods of occupational safety management, which must be taken into account by the management of an enterprise, institution, organisation and the government, the latter also controlling implementation of legislative regulations at workplace, as the economic situation in the country depends to a large extent on the level of production processes functionality. In addition, analysis of existing international standards in the labour protection field has been carried out, their features and scope of application have been considered. On the basis of the revealed data, specific recommendations have been developed, namely, advancement of prosocial behavior, technical upgrade, conduct of briefings and trainings aimed at increasing occupational safety. The research was carried out on the basis of general scientific and special methods of cognition, such as analogy, factor analysis, comparison, structural analysis, expert assessments and opinions, analysis of the causes of industrial injuries and various industrial diseases. The authors investigated the evolution of management and administration in labor protection and industrial safety, their interconnection and interdependence. The result of this scientific work is an understanding of the importance of compliance with safety rules at workplaces, of negative consequences that may arise from non-compliance with legislative regulations and international standards developed by the international community regarding occupational safety. A variety of management methods that can be used during set up of production process, as well as development of recommendations that will help to improve the current situation in labour safety, ensuring protection of labour rights, freedoms and legitimate interests of employees, enacted in most countries by Constitution, have been discussed. Having analysed the fact that currently the state of guaranteeing safe working conditions for employees is in a critical situation, industrial injuries and accidents at enterprises have become widespread. We can come to a conclusion that it is necessary to legislate this situation, to strengthen the legal responsibility of management and employees for non-compliance with safety rules during production process

**Keywords:** labour protection, industrial injuries, accident, briefing, safety rules, management methods

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## INTRODUCTION

In today's world, the issue of labour protection is one of the most important for enterprises in various countries. For many enterprises, safety issues are even more important than economic goals, since the efficiency of production process depends on the workforce productivity. Industrial injuries and accidents significantly undermine the quality of work processes, reducing the number of employees. It is worth noting that safety is a key component of labour protection, the concept of which is defined by some scientists as "a system of organisational-technical, legal, social-economic, sanitary-hygienic, medical-prophylactic, rehabilitational, etc. measures aimed at preserving lives and health of employees during production process" [1]. Other scientists note that "labour safety is a set of legislative and regulatory acts, organisational and technical, sanitary and economic activities and means the guarantee of safe conditions and maintenance of health and working capacity of employees" [2; 3].

Occupational safety is a critical issue that threatens small and medium-sized enterprises worldwide. Accidents, injuries and related property damage can have dire consequences for employees and their companies. This reality raises serious concerns about occupational safety. There is an urgent need for effective intervention to minimise the rate of accidents and injuries, especially those occurring at small and medium-sized companies. The European Union reported that small and medium-sized companies account for 98.7% of the total number of enterprises and employ 50.2% of workforce, while large companies account for only 1.3% of all enterprises [1].

Small and medium-sized companies make a significant contribution to the development of the world economy, guarantee innovative activity and contribute to the creation of a competitive environment [4; 5]. In addition, it is small businesses that are most consumer-oriented, as they quickly respond to new trends [6; 7]. It is also worth noting that they play a huge role in adopting latest technologies and commercial ideas.

It is these reasons that contribute to the formation of a large number of small and medium-sized companies with a sufficient number of employees. However, such a number of small and medium-sized companies is a great load not only for the management, which is obliged to develop rules for labour safety, but also for the government, which must regulate this situation at the legislative level, as well as monitor compliance with the basic rules [8; 9].

The workplace environment of most small businesses is, on average, riskier than that of large businesses, and the implementation of safety regulations and laws may be less effective in comparison [10; 11]. This is explained by the fact that, firstly, small and medium-sized enterprises have a higher rate of accidents and injuries than large enterprises, not only because they are numerous, but also because safety management is insufficient and ineffective.

Second, most SMEs are unable to implement security policies and laws due to limited resources and lack of awareness. Third, there is no expert who can perform and improve

safety management because owner-managers are always safety managers [12]. In addition, such issue as safety management is present, which has only a short-term impact on the control of accidents and injuries [13].

Theoretical significance of this research is confirmed by the analysis of the most urgent existing problems regarding labour safety management, practices for improving labour safety, reducing the level of injuries and accidents at enterprises. Considerable attention will be paid to international standards devoted to labour safety management, as well as effective management methods based on foreign experience, which have proven their effectiveness in increasing the level of labour safety at enterprises.

Practical significance of this research lies in the possibility of determining the current state of labour safety management at enterprises in different countries worldwide, developing effective methods of labour safety management, implementing international standards into the national legislation of states, developing recommendations for improving the situation in labour safety management at enterprises.

Hence, *the purpose of this research* is a complete, comprehensive and in-depth study of occupational safety management, possible reasons for the unsatisfactory state of this management, the standards for occupational safety management defined at the international level, definition of fundamental methods for occupational safety management, process of occupational safety management and its components.

*Objectives of scientific research:*

- 1) definition of the concept and role of occupational safety management;
- 2) analysis of international standards aimed at streamlining labour safety management process;
- 3) identifying reasons causing unsatisfactory state of this management;
- 4) formulation and development of effective methods of occupational safety management;
- 5) development of recommendations that contribute to increasing the level of regulation of labour safety management, as well as improving working conditions at enterprises that will meet modern safety standards.

## LITERATURE REVIEW

Many scientists pay significant attention to the problem of occupational safety management, since the degree of implementation of occupational safety management methods affects not only human life and health, but also the efficiency of the work process. Industrial injuries, accidents, violations of industrial activity become the subject of heated discussions. Thus, the scientific article [1] determined that the modern world is characterised by constant efforts to improve production safety at enterprises, but fatal cases still haunt the industry. Scientists identified three groups of production safety studies. The first group of studies is conducted from the perspective of the safety management process, such as safety assessment and safety program. The second group aims to investigate the influence of individual

and group characteristics on safety, such as employee behaviour and safety environment. The third group uses accident/incident data to improve safety. In order to better cover the tendency of building up safety research, these studies have been discussed from a chronological and thematic viewpoint [1].

A scientific article by Wang et al. promotes national and international interference in occupational safety (OHS) management for small and medium-sized enterprises (SMEs) with the help of internal and external resources [2]. After all, the simulation results indicate that the government does not need to check the security situation of small businesses in real time. Namely, security regulations should be less restrictive for small businesses than for large ones. Based on the characteristics of enterprise management, the dual influence of management and government on employees can positively impact working environment and safety of production process [2]. In turn, Sorensen et al. underlines those efforts to protect and promote the safety, health and welfare of employees increasingly focus on the integration of complex and dynamic work organisation systems and working environments. Currently, most countries in the world are developing policies, programs and practices that combine protection from work-related hazards with the promotion of injury and disease prevention measures to improve employees' wellbeing" [3].

Some scientists examine the process of labor management in small and medium-sized enterprises in more detail and determine its basic components. So, P. Schulte et al. [4] states that the majority of the world's workforce work in firms with fewer than 50 employees; firms with fewer than 250 employees account for 99% of jobs. Despite this, there is a lack of extensive or comprehensive research focusing on occupational safety communication for these small and medium-sized enterprises (SMEs). Given that high rates of morbidity, mortality, and injury occur in establishments with fewer than 250 employees, efforts to reach out to employers to engage in preventive occupational safety are noteworthy. The communication strategy should raise awareness of the diversity and complexity of SMEs and the challenges of targeting OSH communication. It would also be useful to develop national and international strategies for research on communication with small businesses [4]. Olsen & Hasle argue that intermediaries play an important role in the dissemination of national occupational health and safety (OHS) programs for small businesses, but little is known about the factors that influence their role [5]. B. Nowrouzi et al. [6] identifies the main barriers to the implementation of occupational safety and health management systems in the context of small enterprises from the point of view of owners/managers, labour auditors and occupational safety consultants:

- imperfection of taxation system;
- underdevelopment of financial and credit support and risk insurance mechanisms for small enterprises;
- lack of reliable social protection and security for entrepreneurs;
- organisational problems in interaction of small business with the market and with state structures;

- administrative barriers to the development of small entrepreneurship.

McCaughy et al. studies the process of occupational safety management in the USA. Thus, the US Department of Labor has identified the healthcare industry as the primary source of all workplace injuries in the US. Studies have shown that injuries among healthcare workers are associated with high staff turnover, burnout, poor job satisfaction, and a shortage of medical personnel [7]. G. Janet also pays attention to the issue of workplace safety. He notes that the rate of illness and injury continues to be high in the manufacturing environment, despite improvement efforts undertaken by various organisations. Scientists believe that in order to reduce workplace safety incidents and prevent employee injuries, it is necessary to involve management in the use of preventive, directive and corrective control measures [8]. M. Guillemin notes that occupational safety is an important basis for public health, but its effectiveness continues to decline. Examples of this alarming trend indicate that it affects both the health of the working population and retirees, as well as the economy through huge health costs, absenteeism, psycho-social problems, loss of work capacity and quality of work, etc. [9]. E. Ahonen et al. points out that the labour management process was not sufficiently researched. Yes, there is a lack of accurate data to investigate the relationship between work and health, which is necessary, because a large number of accidents and occupational injuries occur precisely at enterprises during production process [10].

## **MATERIALS AND METHODS**

At various stages of the research work, a wide interrelated complex of research methods was used. The methodological basis of the research was the dialectical method of cognition, which allows investigating the development of management and administration in labour protection and industrial safety, their interconnection and interdependence. The research was conducted on the basis of general scientific and special methods of cognition: comparison, analogy, structural analysis, expert assessments and opinions, factor analysis, as well as analysis of the causes of industrial injuries and industrial diseases. With the help of comparison and structural analysis, management methods were studied, which revealed in detail the essence of the occupational safety management process. Using factor analysis, the authors proposed a classification of management methods. The method of expert evaluations and opinions was used in the study of international standards of the labour safety management process. The analogy method was used to determine the advantages of occupational health and safety management system. With the help of the analysis of the causes of industrial injuries and industrial diseases, recommendations aimed at improving the process of occupational safety management were developed.

In the course of the research, it was predicted that the development of safe working conditions is influenced by a large number of factors: the type of work performed and working conditions, design and engineering solutions

at workplace and at the enterprise as a whole, the quality of technologies used, the level of technological discipline, the general organisation of the work process and others. The safety of technological, production, organisational and labour processes at enterprises is ensured by assessing the degree and type of negative impact of dangerous and harmful production factors on the health of employees. The development and implementation of measures to reduce or prevent them is an effective mechanism for improving working conditions. In addition, the empirical method was used in the research process, thanks to which, observation, study and generalisation of the labour safety management mechanism and monitoring of the effectiveness of labour safety management methods were carried out. Particular attention was paid to the implementation of international standards [14-16] in the development of the legislative framework that regulates the process of occupational safety management.

At the first stage of the study, a theoretical analysis of the scientific literature defining the concept of occupational safety management [4-6] was carried out, the essence of its key components and the main goal where employees and management at enterprises must comply with the basic rules, regulatory and legal documents in which the rules are stated, were studied. Scientific articles, dissertations of researchers who focus on the study of the importance of occupational safety and the need for its management were studied and analysed. In addition, researches discuss why there is a higher risk of accidents and industrial injuries at small and medium-sized enterprises. The study also analyses the concept of social behavior, its types, advantages and disadvantages in the management of occupational safety. The scientific article highlights the basic tasks, purpose and methods of research. At the second stage, analysis of international legal standards was carried out (OHSAS 18001: 2007. Occupational Health and Safety Assessment Series. Specification [14]; SA 8000: 2001. Social Accountability Management System [15]; Convention of the International Organization of Practice No. 81 [16]), recognised by the international community as fundamental in the management of occupational safety. What is more, methods of occupational safety management, divided into several main groups, were looked into. In the course of the research, the conclusions were checked and clarified. At the third stage, theoretical analysis was completed, theoretical and practical conclusions were formed, the results were summarised, and ways of solving the current problems related to the process of occupational safety management were proposed. The methodology and techniques used in the study ensured the necessary reliability and validity of the results.

## RESULTS AND DISCUSSION

The key directions in the field of labour protection are the improvement of technologies; development of new technical means and organisational regulatory documents on labour protection; conducting briefings on ensuring the

safety of the production process; evaluation of new equipment and processes from the point of view of their safety in use. In order to ensure occupational safety, it is necessary to take measures to manage it. Occupational safety management refers to the process of identifying, establishing and maintaining such a state of the working environment in which there are no possible consequences of dangerous and harmful factors, or, if their influence does not exceed certain limits, which must be established by law [17-19]. The signs of occupational safety management are, firstly, a specific subject composition, because the process of occupational safety management must be managed by the management of organisations, enterprises, associations; secondly, the direction to create and maintain safe and harmless conditions of the production process; thirdly, the presence of a large number of components, as well as methods and measures that can be adopted to improve safe working conditions [20-22].

In its turn, managing labor safety means maintaining the state of work organisation, working conditions, working tools, technological processes, machines and equipment in such a way as to exclude (or minimise) the influence of harmful and (or) dangerous production factors. The main goal of the occupational safety management process is the prevention of accidents, emergency situations, industrial injuries and occupational diseases [23]. Of particular interest is the approach in which safety management is considered as a set of tasks, which are divided into organisational, technical, economic, physiological and social [24; 25]. The main goal of the interaction of the listed groups of measures is to preserve the lives and health of workers, and the secondary goal is to increase labour productivity [26].

It is also worth emphasising the complexity and specificity of the management system, the influence of team motivation and cohesion on the effectiveness of joint activities, including occupational safety. Given that all the world's leading enterprises (Apple, Amadeus, Mitsubishi, Toyota Motor, McDonalds, Samsung, etc.) in their labour protection policy are guided by the principle: "People are the main value and key resource of the company", there is a need to form such a management culture, where designated people, responsible for the safety of the workplace, managing it as a socio-economic and socio-technical system, should be aware of their role in ensuring occupational safety [27-29]. However, realising one's role in this regard is not enough. The management of enterprises must possess such techniques, methods, and management procedures that will create and ensure a management culture in the field of labour protection, as well as familiarise employees with training on labour safety issues [30]. Labour protection is such a state of the working environment in production where there is no influence of harmful and dangerous production factors on employees, or their influence does not exceed the established limits, or there is no unacceptable risk associated with the possibility of harming the health of employees, it should be managed first of all.

In order to evaluate the effectiveness of the selected labour safety management system, there are certain criteria that form the basis of this process [31; 32]. Despite the

fact that they are quite diverse, the most important among them are: low level of industrial injuries, light severity of injuries to employees during the performance of certain jobs, insignificant deductions for the social insurance fund from accidents, the absence of fines from the inspection and controlling public services, authorising regulatory and legal documents to control compliance with labour safety briefings [34]. In addition, the results of the enterprise's labour protection management should be related to the efficiency of production in general, so that the labour team and each employee are interested in complying with the requirements and rules of labour protection [35; 36]. For this, it is necessary to motivate employees, stimulate them, conduct briefings, predict negative consequences and bring them to the attention of employees [37]. The possibility of strengthening the legal responsibility of both employees and management if they are at fault is not excluded [38]. Therefore, the fundamental task of labour protection management is motivation of employees to observe safe working conditions and selection of appropriate methods (a list of measures) to bring the object of management into maximum compliance with the requirements of legislative regulatory documents and directives on labour protection.

*Methods of occupational safety management.* Since labour safety management is a certain process aimed at preserving and maintaining the lives and health of workers during the production process, certain management methods are considered to reveal in detail the essence of the labour safety management process. Management methods are procedures, ways of influencing the managed system by the controlling subsystem, in other words, the influence of the management subject on the managed object to achieve the intended goal. The efficiency of the production process as a whole, as well as the lives and health of employees, depend on the applied management methods [39]. To implement all management methods, it is necessary to use a controlling mechanism, which is a certain set of principles, methods, measures, and resources aimed at checking compliance with legal principles by both management and employees [40].

Having considered the totality of methods distinguished by scientists, it is possible to systematise them into certain groups, namely:

1. Organisational methods – they include the processes of preparation, adoption and implementation of decisions aimed at preventing and eliminating violations of labour protection rules during the performance of labour obligations. The main components of this group of methods are the distribution of functions in the field of management among the management of enterprises, guaranteeing technological discipline, supervision over the state of working conditions, generalisation of the experience of investigating industrial injuries and accidents during the production process, rationalisation of management taking into account scientific and technical achievements.

2. Administrative and legal methods – they include the development and issuance of legal and administrative acts

that regulate the organisation and management in production, establish the rights and obligations of management, employees, and officials, regulate responsibility for violations of industrial discipline and instructions on labour protection. At the same time, as is known, administrative acts have binding force and affect the labour team of the enterprise, encouraging them to comply with the regulations of the law.

3. Socio-psychological methods – the purpose of the measures of this group is to reduce violations of industrial discipline, reduce the number of illnesses and industrial injuries, increase labour productivity, and preserve the value of the labour team. The methods are the establishment of a system of means of social and psychological influence on the company's staff: establishing stimulating and encouraging factors, conducting trainings, courses, meetings to encourage employees to comply with legislative regulations.

4. Economic methods – application of fines and bonuses, use of the labour protection fund, social insurance fund and other funds aimed at increasing safety at workplace, updating the technological base. These funds should ensure the rational and integrated use of the company's financial resources for the productive functioning of the labour protection service in the labour protection management system. Economic methods are primarily focused on financing measures that increase the safety of production process technologies, including the introduction of new, more productive, safer equipment [12]. Economic methods, oriented at personnel, are connected with a material incentive of safe operations, which form appropriate motivation.

Considering the importance of economic methods, which occupy a key place in ensuring labour safety, the following can be singled out: planning; technical and economic research; technical and economic justification; planning; material stimulation; preferential lending to enterprises; pricing; profit sharing and equity; preferential tax regime for enterprises; establishment of economic norms and standards.

In addition to the above-mentioned methods, M.P. Guillemin singles out several more depending on certain criteria [9]. So, depending on the attitude to the environment of the enterprise, methods of influence from the outside and methods of influence on the inside of the enterprise are distinguished. The first group of methods involves the creation by the state not only of legislative prescriptions regulating the issue of labor safety, but also of special conditions under which enterprises will receive benefits, ensuring the required level of safety – the so-called motivational model. The second group of methods is based on the desire of the company itself to ensure the safety of its enterprise [9]. Taking into account that this activity requires certain financial costs, a technical and economic study and a feasibility study for the implementation of the occupational health and safety project should be carried out before implementation. There is also a certain criterion that allows us to distinguish between two management methods. So, depending on the subject of management, the methods are divided into: used by senior managers, department heads and employees [13].

According to the classification with this criterion, it is worth noting that the top management is the main one in ensuring labour safety, it is them who must control the designation of certain legislative regulations and instructions to the heads of units, and have the right to establish certain rules at the enterprise. In turn, department heads should familiarise their employees with the rules and instructions. Employees are obliged to comply with these rules and not to violate them in any case, in case of violation, fines and even dismissal from the workplace may be applied to them. In addition, workers should remember that violating the safety rules during the production process may cause harm to their lives and health [8].

Therefore, there is a large collection of methods aimed at managing occupational safety, which can improve the safety situation at the enterprise, as well as increase the efficiency of the production process.

*International standards of the labour safety management process.* Taking into account the importance of ensuring occupational health and safety, as it greatly affects the efficiency of the production process, life and health of people, taking into account the general practice, international experts in the field of occupational health and safety have developed certain standards that contribute to increasing the level of safe working conditions and reducing accidents and injuries during production. Thus, OHSAS 18001, ILO OSH 2001 is the most important international standard, a tool for creating safe and healthy working conditions most widely used by various countries in the world and is most popular. The standard provides a basic approach that allows the organisation to consistently identify and control risks to the health and safety of personnel, reduce the likelihood of accidents and incidents, comply with legislation and increase overall work efficiency [14];

Advantages of the health and safety management system are reduction of the number of accidents by prevention of possible problems related to labour protection; compliance with the requirements of legislation in the field of labour protection; increasing profitability by building up trust in organisation and reducing costs for eliminating the consequences of industrial injuries.

The system is applicable to any type and scale of activity of the organisation, regardless of the economic sector. SA 8000: 2001 is an international standard that regulates requirements for the social protection system of company employees and recommendations for its application. In addition, the standard establishes the social responsibility (Social Accountability) of the owner to society and the personnel of the enterprise (company) in matters of labour, including labour protection [15].

The listed standards were developed based on the principles of the Conventions of the International Labor Organization (ILO), the Universal Declaration of Human Rights and taking into account the systems of quality management standards (ISO 9001) and environmental management (ISO 14001). The ILO is of the opinion that it is poor working conditions that contribute to the loss of financial and human resources, undermine labour productivity and product quality [16].

*Recommendations aimed at improving the occupational safety management process.* The workplace environment of most small businesses is, on average, riskier than that of large businesses. Furthermore, due to insufficient resources and funding, safety management has only a short-term impact on accident and injury control [10]. Employees who prioritise labor protection are more likely to give a signal about dangerous or illegal production activities, which guarantees not only their own health, but also the development of the enterprise. This type of behaviour of employees is called “prosocial behaviour”, which has a positive effect on enterprises. Such behaviour is widespread, for example, in China, the government empowers employees to report illegal production activities of enterprises and encourages them to report relevant safety information by paying a reward for doing so.

G. Micheli et al. defines “disclosure” as the behaviour of an employee or administrative staff who discloses certain information, including personal or organisational activities that may be harmful in nature or violate human rights norms [17]. Whistleblowers should take into account the consequences for both the company and themselves, because informing can change the current situation in the company’s security management or lead to psychological stress on employees. G.B. Garnicua & G.D.C. Barrigaa suggested that whistleblowers should consider the consequences of such behaviour in decision-making process, as the results of whistleblowing can have negative effects, such as damaging the company’s reputation or punishment inflicted on the whistleblower’s colleagues [18]. Prosocial behavior can prevent business leaders from making potentially harmful decisions and, thus, can reduce the number of workplace injuries and accidents. A whistleblower must assess the consequences of such behaviour in terms of economic and social costs at each stage of the process [18].

It is worth noting that disclosure can be “external” or “internal”. External whistleblowing is defined as an employee revealing risky behaviour on the part of their company to protective organisations or the government: “anonymous whistleblowing” and “real name whistleblowing”. On the contrary, internal reporting is defined as an employee’s notification of dangerous behaviour or risky conditions to the company’s top management [19]. Internal disclosure is less effective in preventing unsafe practices and may even make the workplace even less safe. When an enterprise treats unsafe production activities as a normal situation, internal whistleblowing is more likely to be ignored. Whistleblowing can also lead to retaliation against the whistleblower. In this regard, employees are more likely to report security breaches in their company to third-party organisations or government agencies.

As a rule, small and medium-sized enterprises do not have social or political support, have limited resources and are exposed to a greater risk of bankruptcy than large enterprises [20]. In addition, SMEs have a low level of security management due to their economies of scale and relatively isolated nature. Workers in small and medium-sized enterprises are temporary, often seasonally employed

and may be relatively unskilled. Safety training and education have limited impact on improving safety in these establishments, and job safety is generally lower than in larger establishments. Business owners are also safety managers, which can make the health and safety management system ineffective and unprofitable. Safety management systems also tend to suffer from a lack of effective intervention or expert safety guidance. Safety training is mainly imparted to employees through informal word of mouth. Owners' job is to make enough profit to keep businesses afloat, so security can be an added burden. Research by K.J. Nielsen et al. [21] shows that small and medium-sized enterprises have riskier work environments and more work-related injuries and illnesses than large enterprises. Since safety management is insufficient and ineffective, the prosocial behaviour of workers and government inspection checks will have a significant impact on the prevention of unsafe industrial activities [22].

To improve the state of ensuring labour safety, managers of enterprises need to systematically conduct briefings on creating safe conditions, test employees to determine the level of their awareness of safety rules at enterprises during production process. In addition, we should not forget about the improvement of equipment at enterprises to create safe working conditions. In turn, state inspections and security services must check the management's compliance with the legal regulations in terms of familiarising employees with safety rules during performance of certain works.

## CONCLUSIONS

Having analysed theoretical aspects of occupational safety management, determining the concept and significance of occupational safety management process at each enterprise, institution and organisation, it is possible to conclude that occupational safety affects not only the lives and health of employees, but also the number of the workforce. Scientists proposed a classification of already

existing management methods, the main of which are: economic, organisational, administrative-legal and social-psychological. These are the principles that can ensure the development of a quality occupational safety management system. Despite the fact that it is impossible to completely eradicate violations of labour safety, the problem of industrial injuries will always exist, its solution requires a wider understanding of the causes of its occurrence, and therefore, more advanced methods of its prevention and elimination.

The essence of labour protection management is to develop a system of measures that ensure obtaining unbiased information about the object of management – an enterprise, institution or organisation – for the development and adoption of a management decision on changing its state to a more acceptable or safe one. The current practice of developing and implementing occupational health and safety measures that have the ability to reduce the number of accidents consists in improving the equipment and technologies used at the enterprise, creating and implementing individual and collective protective measures, approving sanitary and hygienic working conditions, familiarisation with safe techniques and methods of work performance, development of safety rules, compliance with which ensures the required level of safety. The modern problems of accidents and industrial injuries cannot be solved only by improving the technical base, or it will bring a rather small effect, as most often the cause of injuries is not the working conditions, but the dangerous actions of employees who are allowed to perform dangerous types of work, and the lack of familiarisation of the employees with the rules for handling equipment by management.

In order to develop effective labor protection measures, a more detailed study of the mechanism of the occurrence of incidents and accidents is necessary, as low efficiency of existing labour protection measures creates an increased level of injuries caused by insufficient accounting or ignorance of trauma-threatening factors.

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## **Роль управління безпекою праці на підприємстві та чинники його незадовільного стану**

**Анотація.** Актуальність досліджуваної проблеми полягає в тому, що на сьогоднішній день виробничий травматизм та нещасні випадки на підприємствах є доволі поширеною проблемою. Оскільки від гарантування безпеки праці залежить життя та здоров'я працівників, а також ефективність виробничого процесу, управління безпекою праці є важливою та невід'ємною складовою охорони праці. Керівництво підприємств має керуватися принципом, що життя та здоров'я працівників є найважливішою цінністю. Для створення безпечних умов на підприємстві існують певні методи управління безпекою праці: економічні, організаційні, адміністративно-правові, соціально-психологічні. За допомогою них безпечні умови праці можуть бути значно покращені, а отже і збільшена продуктивність виробничого процесу. У зв'язку з цим дана стаття спрямована на визначення поняття безпеки праці як невід'ємної складової охорони праці, її основних компонентів, які складають цілісну систему безпеки праці, методів управління безпекою праці, які можуть бути взяті до уваги керівництвом підприємства, установи, організації, урядом, який також має контролювати виконання законодавчих приписів на підприємствах, адже від рівня функціонування виробничого процесу певною мірою залежить економічна ситуація в країні. Крім того, був проведений аналіз існуючих міжнародних стандартів у галузі охорони праці, розглянуті їх особливості та область застосування. На основі виявлених даних були розроблені конкретні рекомендації – поширення просоціальної поведінки, технічне оновлення, проведення інструктажів та тренінгів, спрямованих на підвищення безпеки праці. Дослідження проводилося на основі загальнонаукових та спеціальних методів пізнання, таких як аналогія, факторний аналіз, порівняння, структурний аналіз, експертні оцінки та думки, аналіз причин виробничого травматизму та різних виробничих захворювань. Авторами були досліджені питання розвитку управління та адміністрування в охороні праці та промисловій безпеці, їх взаємозв'язку та взаємозалежності. Результатом даної наукової роботи є розуміння значущості дотримання правил безпеки на підприємствах, негативних наслідків, які можуть виникнути через невиконання законодавчих приписів, міжнародних стандартів, розроблених міжнародною спільнотою, щодо безпеки праці, різноманітності методів управління, що можуть бути використані під час створення виробничого процесу, а також розробка рекомендацій, які допоможуть удосконалити нинішню ситуацію із безпекою праці, тим самим забезпечуючи захист трудових прав, свобод, законних інтересів робітників, закріплених у більшості країн на рівні Конституції. Проаналізувавши те, що наразі стан гарантування безпечних умов праці працівників знаходиться у кризовому положенні, поширення набули виробничий травматизм та нещасні випадки на підприємствах, можна прийти до висновку, що необхідно законодавчо урегулювати цю ситуацію, посилити юридичну відповідальність керівництва та працівників за невиконання правил безпеки під час виробничого процесу

**Ключові слова:** охорона праці, виробничий травматизм, нещасний випадок, інструктаж, правила безпеки, методи управління

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