

# Integrated HR Risk Management System

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**Abstract.** The study provides an overview of works related to the formation of theoretical and methodological tools for assessing personnel risks. The absence of a unified theoretical approach to building an integrated HR risk management system in organizations has been substantiated. Methods that have a theoretical and methodological basis for creating organizational and methodological tools for managing personnel risks are considered. Proposals have been developed for the development of tools for analyzing personnel risks, affecting the applied aspects of management in the field of labor, taking into account the specifics of activities that are priority from the point of view of the application and use of knowledge, skills and qualifications of workers. The theoretical and practical features of defining promising directions in the development of the theory of personnel risk management based on the competence-based approach have been determined. Presented are some aspects of activities to identify threats in the management of business entities. The theoretical and methodological features of the representation of personnel risk in personnel management procedures are considered. It is shown that the ongoing changes in the field of personnel management require from the management staff to form new approaches to identifying threats in the world of work.

Nowadays, one of the priority ideas is to find the ways and opportunities to overcome emerging difficulties in real time in an unstable business environment. The main difficulty is the search for available instruments that make it possible to form multiple lists of risks and establish the characteristics and causes of their manifestation. Based on these, the need is formed to determine the characteristics of the activities of market players, leading to the emergence of contradictions, instability and the manifestation of threats among them, that can be cause of damage. This activity means accounting personal and collective requirements in society, however, risk management can be difficult without it. This means that we need a modern personnel risk management system, which fits modern challenges, integrated into various areas of human activity and based on using of knowledge and skills of employees.

Human activity is constantly becoming more complicated, as a result the area of risk perception expands. In this regard, an important management goal is to form a list of significant deficiencies in socio-economic system that are the cause of external threats in relation to economic entities.

The problem of risks is divided depending on the specifics of the activity, which is confirmed by changes in the human community, interpreted as a transition to the next

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technological order. There is no exist definition of term "personnel risk", it proves its controversial nature of understanding. It is connecting with ambiguity of term "risk". In this way, there is necessity of development of the theory and methodology of personnel risks as a separate area. There are many threats in different economic areas. If management of the organization can distribute and streamline them, it might be lead to reducing the likelihood of potential risks.

Risk analysis is usually performed using a variety of economic and mathematical tools. An effective method is a systematic approach that allows you to synthesize the quantitative and qualitative characteristics of the phenomena associated with the manifestation of personnel risks. There are many law documents hat affect the issues of risk modeling, it is possible to single out among them - the National Standard of the Russian Federation PNST 148 2016 "Risk Management. Risk Assessment Methods.". It contains a list of risk assessment methods. The methods specified in this document apply to personnel risks and are promising in the use of approaches to the analysis of the human factor, which makes it possible to isolate the root causes of hazardous situations provoked by employees.

In the national standard of the Russian Federation "Risk Management. Terms and definitions "(GOST R 51897 2011) provides terminology related to risk management. In particular, it states that "risk management is coordinated actions to direct and control an organization in the area of risk." It is noted that this standard is identical to the international document "ISO Guide 73: 2009" Risk management. Dictionary. Guidelines for use in standards "(ISO Guide 73: 2009" Risk management - Vocabulary - Guidelines for use in standards ")". Risk management for this regulatory document is "Coordinated actions to direct and control the organization in relation to risk". In the guidance of the Ministry of Health of Russia 2.2.1766-03 "Guidelines for assessing occupational health risks for workers. Organizational and methodological foundations, principles and evaluation criteria. " the features of the organization and conduct of professional risk assessment are presented. It is indicated that the risk is understood as "" the likelihood of causing harm to the life or health of citizens ... ". Reference is made to the Federal Law "On Technical Regulation" dated December 27, 2002 No. 184-FZ.

New areas of application of human skills appear, which have their own specific dangers, and, accordingly, security systems are developing with the priority of reducing personnel risks [1]. Distinguishing lists of risks are created that relate to the human resources sector. They refer to integrated management systems in various areas of application of knowledge, skills and abilities of workers. This study provides an overview of the theoretical and methodological features of personnel risk management necessary to get an idea of the specifics of identifying threats in the field of management.

Let's turn to a variety of analytical tools in the field of labor management. The content attracts attention due to the lack of a generally accepted approach to understanding the content of personnel risk as a socio-economic category. Based on this, the scientific problem of the absence of a theoretical justification for the need to form a unified approach to the allocation of personnel risks in the system of socio-economic relations is formulated. The aim of the study is to develop a toolkit for the formation of practice-oriented approaches to the management of business entities, which are necessary and sufficient for the creation of integrated HR risk management systems. The subject of the research is understood as labor relations that form personnel risks and are manifested in various spheres and areas of the socio-economic organization of human activity.

Let us consider the problem of concretizing and highlighting threats and dangers. It should be noted that in personnel management, any action entails personnel risk due to the possibility of not implementing the decision (order, order, etc.). For example, [2] indicates that one of the tasks of personnel assessment is to reduce the risk of promoting incompetent employees. The mention of the risk already indicates that there is one or another danger in

the personnel sector, for example, an employee getting a position that does not correspond to his level of training. There are various definitions of risk. In this regard, many authors provide their own formulations of the definition of risk in the format of presenting the problems of identifying current threats. Definitions of risks are present in [3], where the emphasis is on sources of threats external to the organization. In a visual form, the distribution of past events across the forecast horizon is presented with a display of the probability density. This approach can be used if there is a need to obtain a forecast and the possibility of obtaining a sufficient amount of information on the existing threats encountered in the banking, currency, political, interest areas.

The importance of decision-making methods focused on the timely identification of risks in the context of the economic activity of society is increasing. Most of them touch upon the classification of personnel risks as a mandatory section, which is explained by their great variety [4]. Personnel risks are an integral part of labor risks, therefore, a single analytical toolkit and related issues can be applied to them. Human labor risks are manifested in all areas of the economic sphere. Particular attention is paid to them in the economic sphere, the importance of which is determined by the very nature of business entities. Considering the content of risk in relation to the labor component of the management process, it is natural to note the variety of terminology related to it. Thus, theoretically, the problem of risks is widely disclosed. There remain uncertainties regarding personnel risks and the possibilities of building an integrated system for identifying promising threats, integrated into various areas of organizations' activities, which exists regardless of the specifics of economic relations.

Let us consider the problem of identifying labor risks and draw attention to the lack of a generally accepted approach to understanding the content of labor risks as a socio-economic category. This is consistent with all HR issues. HR risks are an integral part of labor risks. Based on this, the theoretical and methodological foundations of labor risk management can be laid in the basis for making management decisions affecting the specifics of the manifestation of threats in the personnel sector. Labor risk is considered in a number of works of a fundamental nature [5]. In [6] an opinion is given according to which risk is a probabilistic category and fully corresponds to the understanding of an event that poses a threat. The opinion is substantiated according to which the economic essence of labor risks is broader than qualification and personnel risks, which is quite fair.

In [7], a definition is given according to which labor risk is the probability of an event occurring, interrelated with the labor process and carrying adverse consequences. This understanding fully reflects the essence of the concept of "labor risk" and is convenient for practical purposes. Also in [8] the definition of labor risk management is given, which is understood as the impact on unfavorable circumstances in order to form a mechanism to reduce the likelihood of risk. The mechanism of such influence implies the definition of the tasks of labor risk management. Thus, the problem of the formation of the personnel structure is manifested, taking into account the existing threats and dangers. In [9] labor risk is defined as a "subjective-objective category" and its description is given. Such a description is voluminous and makes it difficult to perceive the essence of labor risk. In [10] are considered labor risks, which are reflected in personnel. Situations are also traced in sufficient detail when threats manifested in some areas provoke the emergence of risks in others.

A fairly detailed analysis of the terminology related to risks is performed in [11]. A list of definitions of the term "risk" in international and national regulatory documents is presented. The information here represents the sequence in which risk definitions are presented in integrated management systems. Consideration of this source shows that the category "integrated systems" is understood mainly as technical systems (the safety of machines is considered). To consider the essence of personnel risks, it is of interest that in this work definitions of risk from various standards are given. The concept of "risk of an integrated management system" is also formulated. In [11], such a risk is understood as "the

potential (probability) of exploiting the vulnerabilities of a process / system or a group of processes / systems by a specific threat to damage the organization or fail to achieve the goals set by the organization". In all of the above formulations, risk is defined as a combination of the likelihood of damage and the severity of that damage. Focusing on personnel risks and taking into account the definition given in [5], it can be stated that in integrated management systems it is advisable to specify personnel risks taking into account the degree of probable harm (damage). Hence, an intermediate conclusion can be drawn, according to which the problem of creating integrated systems for managing personnel risks in organizations for technical systems has been sufficiently worked out. With regard to integrated management systems in the socio-economic sphere, personnel risks should be considered as a separate area, taking into account the priorities and characteristics of employee management.

With regard to personnel risk, concretized from the point of view of personnel management, it is rather difficult to assess the mutual influence of risks and threats in various spheres of economic activity. In situations where integrated management systems are analyzed, there is a natural interest in identifying risks using mathematical tools. Since the fact of the presence of integrated systems implies the formation of a clear, systematic organization of decision-making, the analysis of dangerous situations must be performed using a tool that makes it possible to manage risk situations [12]. The article describes the procedure for modeling the mutual influence of goals and risks of projects for the implementation of an integrated enterprise management system based on fuzzy cognitive maps. It is pointed out that risk is a potential, numerically measurable possibility of unfavorable situations and associated consequences in the form of losses, damage, losses due to uncertainty. The risks of the project for the implementation of integrated management systems are linked to losses and are considered as a measure of the dispersion of the studied indicators obtained as a result of the forecast. For the sphere of personnel management, it is significant that in integrated management systems, risk assessment is carried out using fuzzy cognitive modeling tools. The output of the analysis is a cognitive map of the implementation mechanism of an integrated project management system at the enterprise. From the point of view of assessing personnel risks, such a tool can be used in situations where the purpose of the analysis is to assess threats with obtaining performance indicators that do not have an exact quantitative expression.

A common risk assessment tool is the probabilistic method. When using it, it is assumed that the procedures for analyzing the opinions of experts with the accompanying determination of their competence are carried out. [13] provides an example of using the expert method of risk assessment. The result of the analysis procedure is a point estimate of the magnitude of the risk. The method of expert assessments is widespread due to the sophistication of the used mathematical apparatus. Nevertheless, it has a significant drawback, namely, the requirement to operate with probabilistic values. In [13] it is indicated that the expert method is used when constructing a project decision tree to assess the likelihood of possible outcomes occurring. Proceeding from this, it is advisable to use the algorithm given in [13] when obtaining evaluative criteria for making managerial decisions and taking into account a specific risk.

The specificity of existing threats determines the features of approaches and methods of risk management. The assessment methods that exist to date do not meet the needs of specialists in the field of personnel development due to the frequent use of mathematical apparatus of different levels of complexity. A separate toolkit in the field of risk modeling is the apparatus of deep mathematical analysis, in particular, differential calculus, which allows various options for generalizations. Finding the antiderivative (integral) of arbitrary functions in relation to the practice of determining risks requires, in addition to knowing the peculiarities of the management sphere itself (i.e., the specifics of management as dram), deep knowledge of the order of searching for functions by their derivatives. The extent to

which the mathematical concept of a whole quantity as a sum of infinitesimal quantities will contribute to risk assessment is left to the discretion of the researchers. Thus, the problematic of the use of an interdisciplinary approach is manifested, in particular, the use of the apparatus of mathematical analysis, affecting the specifics of determining and assessing risks and requiring a deep mathematical training of the researcher.

From the applied tools, a group of methods can be distinguished, which makes it possible to determine the coefficients of the importance of various probabilistic alternatives. It is convenient for the identified risks to establish an indicator (criterion) of the quality of decision-making, as well as to set the condition for the superiority of one risk (or one alternative of decision-making) over another. Since the risks differ among themselves, they are ranked when making decisions. The use of ranking methods makes it possible to assess the degree of superiority of risks in their alternative comparison. In the simplest version, it is convenient to use binary relations between alternatives (risks), which provide an opportunity to make the transition from qualitative to quantitative measures in the procedures for assessing the degree of detail of labor risks.

There is a sufficient amount of proven higher-order tools that provide the ability to perform HR risk analysis. To obtain the value of the importance factors, the personnel information required for risk management is initially accumulated. Next, an analytical relationship is established between the areas of manifestation of labor risks and the selected criteria. One of the most frequently used methods for determining the importance coefficients is the hierarchy analysis method, in which the priority of elements is assessed according to the selected criterion [14]. To assess personnel risks, it is convenient to choose the features of the manifestation of personnel risk as elements. Each of the coefficients represents a certain specific measure of risk. Comparison of the coefficients among themselves makes it possible to draw conclusions regarding the degree of personnel risk for each of the criteria. The analysis of the importance of the criteria that determine the influence of the areas of risk manifestation makes it possible to assess the feasibility of realizing the set goals (mission) and to formulate alternative solutions.

Determination of classification signs is one of the problems that one has to face when identifying personnel risks in personnel management. The classification tasks are touched upon in most works concerning the problem of identifying personnel risks. For the practice of managing organizations, it seems convenient to subdivide personnel risks according to the principle of "entry", "inside" and "exit". In [15], an example of the classification of such risks is given. At the same time, in [10], the risks are linked to the territorial relocation of an organization, which makes it possible to assess threats in relation to a specific situation associated with relocation to another region.

In [16] the issue of risk assessment and forecasting in the business process management system is considered. The author's model of quantitative probabilistic assessment of risk levels in the decision-making process is presented. An equation is proposed, in accordance with which a probabilistic assessment of the quality of the evaluated process is determined. A quantitative risk assessment for the selected indicators is carried out by the institution's quality council, the characteristics of which are approved by internal documents, taking into account the metrological parameters of the equipment. The risk assessment is built on the basis of using the formula for calculating the distribution density of the studied indicators, the value of the risk is determined from mathematical expressions based on integral calculus. In [16], the author reasonably points out that in a real situation, risk is an aggregated result, i.e. depending on many factors. Since the processes in a medical institution are analyzed, an unambiguous conclusion can be made that the more accurate the estimated risk parameters of the equipment used, the more they depend on the success of its functioning. With regard to integrated HR risk management systems, this means that initially it is required to determine

the set of factors that determine the occurrence of risk, and select from them those that provoke the emergence of the greatest threats.

Risks are an integral part of social and labor relations and have a direct impact on decisions made by the management team of market entities. The specificity of the personnel sector is determined by the fact that many risks exist in an implicit form. The list of risks is formed taking into account the significance of existing threats to society. This determines the type of management tasks related to personnel and socio-economic preferences of workers. In [17], the specifics of the relationship of a young specialist with a mentor in a production organization are presented, with the presentation of the functions of a mentor in the "mentor - young specialist" system. The absence of mentoring functions automatically leads to an increased risk of the manager not fulfilling his role, and, as a result, the loss of young specialists. A list of significant characteristics of the mentor is given ("example in work", "does not forget to mention for good work", "correctness in remarks", etc.). A description of problem areas and opportunities for achieving effective solutions when working with young specialists is carried out. In general, work with young personnel is one of the areas of personnel activity, in which, in the absence of priorities in management and analysis of long-term prospects, there is a clear threat of manifestation of the phenomenon designated as "professional burnout of specialists".

The allocation of personnel risks is closely related to the problems of the development of socio-economic formations similar to human capital. In conditions when there is a rapid development of digital technologies, the theory of human capital has received a new development [18]. Human capital is formed in the process of making personnel decisions, which means that many personnel risks are associated with it. As a socio-economic category, human capital is closely associated with income generation [19]. In labor theory, the phrase "human capital formation" is used, which means any purposeful action related to personnel management. When we talk about the "formation of human capital", this process is understood as a complex of management influences aimed at obtaining human capital of a certain quality. To achieve the desired result in management procedures, knowledge of the internal structure of human capital is required.

An example of the analysis of the category "human capital" shows that in relation to the socio-economic sphere, it is necessary to develop a set of risks that characterize the various components of human potential. For example, the presence of creative potential enables the employee to pursue the desire for self-realization. A sufficient level of intelligence, as a rule, makes it possible to carry out scientific activities. But, having reached the appropriate level of self-development, a person may well feel a desire to raise his official status, which is not always consistent with the desires of the management team. Therefore, any change in the component included in human capital or labor potential entails the manifestation of one or another personnel risk.

The methodology for identifying labor risks is based on social, labor and organizational and economic relations of business entities. Such relations are represented by labor potential, which is a pronounced socio-economic formation. To identify the risk of failures in the process of managing the world of work, you can use the analysis of the components of labor potential that have the greatest impact on the occurrence of labor risks. When making personnel decisions on the basis of the approaches given in [7], the connection of the components with the possibility of a risk is determined. The risk manifests itself when the technical and economic indicators of labor activity deteriorate, which makes it possible to assess the amount of possible losses in case of actual deviations of indicators from the standard or reference values. The determination of the importance of the components is carried out by any method that makes it possible to select them with the priority of a criterion that determines the possibility of achieving the set goals. Hence it follows that for each component of human potential, it is required to create a base of personnel risks.

The above features of the implementation of human capital and labor potential can be expressed through competencies that show a person's ability to effectively solve labor problems, [20]. For the development of human capital, practical approaches are needed that make it possible to compare competencies according to the selected criteria and compare them with each other, comparing them taking into account the selected components of labor potential. Today, there are many organizations with a staff, the performance of which is determined by the most professional workers. This is true, since such workers usually make key decisions. As an example, these include the chief accountant, senior manager, high-class computer technology specialists, the most experienced workers. Such a composition allows you to assess the risks when using employees with the appropriate qualifications. Hence, it follows that risks are closely related to the competencies of employees, and the development of an analysis apparatus is required, which is built into the toolkit of the competence-based approach and makes it possible to compare personnel risks and key competencies of employees.

A feature of the formation of competencies is that they implicitly reflect the risks of personnel management. Competencies usually characterize the professional level of employees (required or desired). The minimum display of the level of knowledge, skills and abilities is the border of the acceptable personnel risk. Therefore, a reasonable set of requirements for competence in a certain profession, representing the level of its formation, is a guideline for the management team in identifying threats and dangers in the field of risk management. The toolkit of the competence-based approach is sufficiently developed. [21] provides detailed procedures for applying the competency-based approach to enterprises. Opportunities for defining risk areas and identifying categories of personnel that are potentially ready to resist the introduction of changes are presented. The article [Gilding digital literacy] shows how important digital literacy is for workers today. This issue is of particular relevance in light of the events associated with the pandemic and the transfer of a significant part of employees to a remote work format. The competency assessment scale is interesting. It can serve for formal display of personnel threats, provided that appropriate qualification reference books are created. In the publications of [21], the idea is traced that the use of the competence-based approach can be extended to all subsystems of personnel management. This is true, but at the same time, there is inevitably a need to identify threats determined by the presence of a minimum level of development of professional skills and abilities of the staff.

The toolkit for identifying personnel risks has shown good results in practical use, taking into account the capabilities inherent in the competence-based approach. The list of practical and research tasks fully fits into the logic of the formation of competency models, determined by the peculiarities of procedures and technologies for identifying current threats. Consequently, the competence-based approach is an effective means of implementing management technologies when creating integrated systems for managing personnel risks in organizations, regardless of the specifics and scope of human activity.

It can be concluded that building effective systems of regulation and identification of various threats is advisable in situations where senior management representatives take actions aimed at obtaining a systemically organized tool for managing personnel risks. A promising direction in the methodology for analyzing personnel risks is the identification of logical relationships between threats in the application of labor skills and socio-economic categories that determine the content and scope of manifestation of personnel risks. It follows from this that the development of tools is required that makes it possible to link theoretical models and the results obtained from the practice of personnel management.

Risk management systems are integrated into various spheres of human life. They solve the problems of forming an up-to-date list of risks at the current time. A practically important and proven in practice area of application of various management methods is the optimization

of the personnel management process. In this regard, further research in the field of economics, affecting the processes of reproduction of the labor force, taking into account the existing threats, should be concretized in relation to the specifics of the activities of the organization of labor. The formation of practice-oriented approaches to the management of organizations is relevant for the competitive environment. They make it possible to create integrated HR risk management systems. With regard to labor economics, it is required to develop tools that make it possible to determine the features of the integration of personnel management systems into the intra-organizational environment. It can be concluded that the area of analysis and assessment of the likelihood and consequences of the onset of adverse events in the personnel sector has a significant theoretical and methodological potential for its development with their inherent characteristics.

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