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Methodological Approaches for Creating a System of Security Indicators for Company´s Personnel

Enfoques metodológicos para la creación de un sistema de indicadores de seguridad del personal empresarial

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RESUMEN

El artículo corrobora la necesidad de identificar principios para construir un sistema de indicadores de seguridad del personal. Se ha encontrado que no existe una base metodológica para un sistema de indicadores de seguridad del personal y es necesario determinar la composición de los principios para su selección. El indicador debe reflejar la presencia de la seguridad de la empresa, que es un principio prioritario para establecer un sistema de indicadores. Una lista de principios para dicho sistema incluye relevancia para objetivos, objetividad, mensurabilidad, complejidad, multicolinealidad permisible, variedad, validez, simplicidad. El artículo presenta un sistema de indicadores de seguridad del personal.

Palabras clave: Amenazas, Indicador, Principios, Seguridad del personal, empresas.

ABSTRACT

The article substantiates the need to identify principles for building a system of personnel security indicators. It has been found that there is no methodological basis for a system of personnel security indicators and there is a need to determine the composition of principles for their selection. The indicator should reflect the presence of the company's security, which is a priority principle for establishing a system of indicators. A list of principles for such a system includes relevance to the goals, objectivity, measurability, complexity, permissible multicollinearity, variety, validity, simplicity. The article presents a system of personnel security indicators.

Keywords: Indicator, Personnel security, Principles, Threats, company.

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INTRODUCTION

Personnel security plays a key role in the economic security of any company, whose human resources and intellectual potential are the key factors of success. This circumstance predetermined a large number of ongoing studies in the field of personnel security, in particular. However, as many scientists note, intellectual capital is twofold: on the one hand, it is a production resource, and on the other hand, it is an independent intellectual entity acting in its interests, which often leads to a conflict of interests between the company and the entity (its employee). Therefore, the threats associated with the personnel are also twofold. On the one hand, a company can violate the interests of an employee, and on the other hand, an employee can harm a company by conscious or unconscious destructive actions. This circumstance should be taken into account when organizing the personnel security system, in particular while identifying types of threats.

The analysis of published materials allowed us to draw several general conclusions. First, researchers do not set the task to form a system of threats to personnel security. Researchers identify threats only to determine the causes or factors affecting the level of stability of the economic system and, based on this, they develop measures to prevent and eliminate them. It should be noted that the lists of threats emitted by different authors differ, which, in our opinion, is due to several reasons. Firstly, at present, the theory of economic security is under development, its common conceptual framework has not yet been formed, in particular, a unified approach to the content of categories of dangers, threats, and risks has not been formed. The wordings and formulations presented in the legal acts and scientists' papers are contradictory. Secondly, the actual composition of the threats is not subject to research. Thirdly, threats to the personnel security of the company are individual, due to the specifics of activities (a type of activity, stage of development, development strategy, etc.).

However, the identification of threats composition is of fundamental importance in developing methods for assessing the level of personnel security. This provision is laid down in the Economic Security Strategy of the Russian Federation for the period up to 2030, which states that one of the tasks of ensuring security is "to identify and assess existing and potential challenges and threats to economic security".

Threat assessment is carried out with the help of indicators, each one of them is considered as "a sign that signals the market participants about possible factors of ill-being, and lowering the level of economic security". The role of an indicator is determined not only by its ability to reflect the state of the economic system or its security but also to identify or select mechanisms and tools to prevent threats and minimize risks: "the quality of the entire personnel assessment system depends on how competently security indicators are selected. The system of indicators should reflect the main processes that shape the strategy and affect the state of personnel security of a company" (Khoruzhiy et al.: 2019, pp. 69-78; Annía et al.: 2019, pp. 1357-1372).

In this regard, the main goal of the current study is to build a system of personnel security indicators based on the formulated principles of this system formation. By the purpose of the study, the following principal tasks were identified:

- Formulation of principles for developing the system of economic security indicators;
- development of a system of a company's personnel security indicators.

METHODS

The fundamental principles of the theory of economic systems and economic security served as the methodological basis of this study. The methods of economic and mathematical modeling were used when constructing models of personnel safety indicators.

The study is based on a logical analysis of scientific works in the field of personnel security of business entities, in particular, studies on the development of indicators of different levels.

The information on 10 enterprises located in Moscow and the Moscow Region was used as a factual basis for the study.

Our analysis of research in the field of indicative assessment of personnel security has led to several conclusions. Firstly, the list of indicators proposed by scientists and specialists exceeds 60. On the one hand, the diversity of indicators reflects the multifaceted nature of the personnel security system, which includes a large number of entities and their interests that must be protected. On the other hand, the whole set of indicators can be divided into several groups about their content.

RESULTS

The first group consists of indicators that can be conditionally named individual, i.e. reflecting the individual preferences of employees, their physical and psychological state, etc. The second group of indicators characterizes the state and dynamics of human resources as a whole: the structure of the personnel according to various criteria, its changes, etc. The third group includes indicators that reflect the company's activities and results in general, or in certain areas (manufacturing faults, cost level, etc.). This grouping of indicators was carried out by us, the authors did not substantiate their proposals on the inclusion of indicators in the personnel safety assessment system, being guided by the general idea that it reflects one of the sides of either the state of human resources or the results. This confirms the assumption of the lack of consistency in the formation of a system of personnel safety indicators.

Thus, the first group includes the indicators that can conditionally be called individual, i.e. reflecting the preferences of individual staff members, their physical and psychological condition, etc. The second group of indicators characterizes the human resources of a company and their dynamics: staff structure based on various criteria, its changes, etc. The third group includes indicators that reflect the company's activities and its results in general, or in certain areas (manufacturing defect, cost level, etc.). This grouping of indicators was carried out based on the analysis of the works mentioned above; their authors did not give a reason for including indicators in the personnel safety assessment system being guided by the general idea that it reflects one of the sides of either human resources or results. This supports the assumption that there is a lack of the systematization of personnel safety indicators.

It was established that, despite a large number of indicators, more than a third of them (31%) do not reflect personnel security threats, but characterize either the company's human resources or the process of staffing, for example, the proportion of managers who have undergone training, dynamics of the average headcount, the proportion of bonus (variable) part in the total wage fund. Thirdly, almost all threats are reflected by a few indicators, thus the need for additional research to verify the redundancy of indicator systems. Fourthly, many indicators cannot be calculated and evaluated, for example, the company's reputation, the system of labor financial incentives, violation of trade secrets, the valuation technologies in the recruitment process, etc. Although a variety of approaches to the composition of indicators is normal for scientific discussion, all other results indicate the lack of principles of a systemic personnel security assessment (Nikoliuk et al.: 2018).

The development of a system of personnel security indicators requires, first of all, determining the purpose and the principles of its creation. The purpose follows from the content of two basic concepts: "indicator" and "personnel security".

There are two fundamentally different approaches to the definition of personnel security: substantive and functional. The substantial approach associates the personnel security with the state of economic system in which any threats to the interests of parties to social and labor relations are prevented, while according to the functional approach personnel security is a system preventing these threats itself. Considering an indicator as a variable, reflecting a characteristic of the studied object which can be observed and measured to express an opinion on the object as a whole or on its other characteristics that are inaccessible to direct observation, gives two ways to identify the purpose of forming a system of indicators. The indicators should characterize

firstly the economic system as a whole, and secondly, the system for ensuring its security. It should be noted that these two approaches to the definition of security and, therefore, the goals of forming a system of indicators have a right to exist. They only should be clearly understood and underlie the construction or selection of indicators.

Thus, the basic principle of personnel security indicators system is its purpose or 'fit for purpose'. So, A.V. Glushchenko (Glushchenko et al.: 2018, pp. 87-99) believe that "the basis for determining the level of personnel security ... is a set of indicators, whose distinguishing feature is its cross-referencing with the four-level system of classifying threats to personnel security" (Glushchenko et al.: 2018, pp. 87-99). The ability of an indicator to express a threat is also considered as its principal characteristic by Denisova (Denisova & Kobenko: 2018, pp. 186-190). Earlier, the indicators reflecting threats to personnel security were proposed in (Nikoliuk et al.: 2018).

In her study on personnel security indicators,Tsvetkova & Klevets (Tsvetkova & Klevets: 2017, 163-169) identified their five main characteristics: measurability, complexity, diversity, simplicity and visibility (Tsvetkova & Klevets: 2017, 163-169).

Tsvetkova (Tsvetkova: 2016, 159-163) also notes that "to obtain a reliable result, it is required that the system of indicators include both quantitative indicators evaluated with the help of mathematical tools, and qualitative indicators evaluated by authorized experts" (Tsvetkova: 2016, pp. 159-163). Moreover, the author believes that the requirement of diversity can be achieved through the use of qualitative and quantitative indicators. However, it should be noted that objectivity can be achieved by using indicators quantified by objective parameters (threats). The use of expert assessments renders indicators more subjective, on the one hand, and, on the other hand, the formalization of the assessment procedure is required. The priority of indicators that can "quantitatively reflect the level of threat" is indicated by Denisova & Kobenko (Denisova & Kobenko: 2018, pp. 186-190). Thus, the principles of forming a system of indicators should include their measurability, objectivity, i.e. priority of quantitative evaluation.

The need for a complex composition of personnel security indicators, according to Tsvetkova & Klevets (Tsvetkova & Klevets: 2017, 163-169) is explained by "processes related to personnel" and therefore the indicators should reflect "motivational systems, personal characteristics, staff satisfaction with working conditions, etc." (Tsvetkova: 2016, pp. 159-163). Denisova &. Kobenko (Denisova & Kobenko: 2018, pp. 186-190) associate the complexity with "functional components of a company's economic security" (Denisova & Kobenko: 2018, pp. 186-190). However, complexity is the principle of any system creation. But it can lead to a redundancy in the list of indicators and, consequently, to an increase in costs. To avoid these shortcomings, it is also necessary to be guided by the principle of permissible multicollinearity. The effectiveness of applying the principles of complexity and permissible multicollinearity will be achieved to a greater extent if differentiation is included in the system of principles, which involves the formation of a list of threats and corresponding indicators according to their ranking for a particular situation.

Tsvetkova (Tsvetkova: 2016, pp. 159-163) associates simplicity of indicators with the availability of methods for their evaluation and notes that "a lot of complex mathematical methods can result in an error in calculations and contribute to the inefficiency of total evaluation" (Tsvetkova: 2016, pp. 159-163). Errors in calculations are made by humans and do not depend on the complexity of mathematical tools but personal skills and qualifications. However, the validity of the applied mathematical apparatus to the economic content of indicators to be evaluated is essential. Simplicity as a principle of forming a system of indicators should be considered in terms of the possibility of obtaining information for their assessment.

Thus, the principles of the formation of a personnel security indicator system should include relevance to goals, objectivity, measurability, complexity, permissible multicollinearity, variability, validity, simplicity. The application of these principles allowed forming a system of personnel security indicators that can not only reflect the existence of threats and their level but also developing adequate tools to prevent them.

DISCUSSION

This system includes both relative and absolute indicators that reflect certain circumstances, for example, the number of following cases for a certain period (year, month):

- A staff member acting in the interests of third parties;
- Illegal actions and violation of obligations to the employer;
- Physical violence, blackmailing, intimidation of company employees;
- Fires, flooding, emergencies, etc;
- malfunctions of equipment, machinery, mechanisms that can lead to fires, flooding, emergencies;
- Violations of labor discipline per 10 (100) employees;
- Use of faulty technical equipment (machinery, equipment, mechanisms, etc.);
- Absence or inadequate quality of personal and collective protective equipment;
- Conflicts in the workplace;
- Unfulfilled tasks: in the case when the employee responsible for their solution accuses another staff member in the failure;
- Projects not implemented due to omission in performing one's official duties;
- Disclosure, transfer of confidential information to third parties;
- Distortions of information contained in on paper or in electronic databases;
- Theft of documents;
- Dissemination of false, distorted or inaccurate information that could harm the company's and its managers' reputation;
- Intentional and unintentional destruction of resources;
- Intentional and unintentional damage to property and/or it is quality;
- Theft of tangible and intangible financial assets;
- Conclusion of disadvantageous deals for lucrative purposes;
- Financial fraud and manipulations with the property;
- Unauthorized operations, including sale of securities, tangible and intangible assets for private gain;
- Falsification of reports on the use of budget funds, etc.

The complete list of relative indicators has not been covered, but the most of indicators of personnel security are presented in table 1 about principal threats.

CONCLUSION

The study allowed to obtain the following conclusions:

1. The main weaknesses of personnel security indicators lists compiled by scientists and specialists have been identified, among which the lack of consistent relationship with threats to personnel security, the redundancy of indicators (over 60), and the inability to quantify separate indicators;
2. The root cause of these weaknesses is the lack of methodological basis for indicators system formation;
3. The formation of personnel security indicators system based on the principles has been justified.
4. A list of principles for building an indicators system has been formed, including relevance to the goals, objectivity, measurability, complexity, permissible multicollinearity, variety, validity, simplicity;
5. The principle of relevance to the goal of addressing threats to personnel security should be considered as a priority principle for building a system of personnel security indicators;
6. A system of personnel security indicators has been built.

Threat	Indicator	Formula for calculating	Signs description	Authors
Occupational morbidity	Morbidity ratio (per 100 persons)	$n \times 100 \div N$,	n – number of clear cases of professional illness N – the total number of the company's employees	Karzaeva (Karzaeva: 2019, pp. 62-74) Davydova (Davydova: 2019, pp. 98-108)
-the decline in personnel quality -inaptitude to the position held; - violation of working and rest conditions; violation of regulations; - hazardous work performed by employees without proper skills and expertise; - inaptitude to the position held;	the proportion of employees with the required level of professional education	$n \times 100 \div N$,	n – number of employees with the required level of professional education N – the total number of the company's employees	Karzaeva(Karzaeva: 2019, pp. 62-74) Davydova(Davydova: 2019, pp. 98-108)
	Adequacy of professional standards	$n \div N$,	n – number of requirements conforming to professional standards; N – total number of requirements	Karzaeva (Karzaeva: 2019, pp. 62-74) Davydova (Davydova: 2019, pp. 98-108)
	The proportion of qualified personnel	$Sq \times 100 \div S$,	Sq – number of employees regularly taking professional development courses; S – total number of staff	. (Khoruzhiy et al.: 2019, pp. 69-78)
	The proportion of employees who haven't been certified	$Sd \times 100 \div S$,	Sd – number of employees who haven't been certified; S – total number of staff	Snitko et a, (Snitko et al.: 2016, pp. 9-20)
	The proportion of employees who haven't been trained in the use of technical equipment	$St \times 100 \div S$,	St – number of employees who haven't been trained in the use of technical equipment S – total number of staff	Karzaeva (Karzaeva: 2019, pp. 62-74) Davydova (Davydova: 2019, pp. 98-108)
	Staff composition by education level	$Sei \div S$,	Se – number of employees with I level of education; S – total number of staff	Glushchenko (Glushchenko et al.: 2018, pp. 87-99); Tsvetkova & Klevets (Tsvetkova & Klevets:

Table 1. System of the company's personnel security relative indicators

				2017, 163-169)
-labor pirating; - inducing employees to illegal actions and violation of obligations to the employer; - ineffective motivation system	level of the ratio of actual wages with "deserved" ones (according to employees)	$Wf \div Wn,$	w_f – real wages w_n – «deserved» wages (according to employees)	Belonogova. (Belonogova et al.: 2011, pp. 119-124), Khoruzhiy et al (Khoruzhiy et al.: 2019, pp. 69-78)
	the level of the ratio of wages in the enterprise with wages in other enterprises of the region	$W \div Wi,$	w – wages at the enterprise w_i – wages at the enterprise i	Karzaeva (Karzaeva: 2019, pp. 62-740 Davydova (Davydova: 2019, pp. 98-108)
- inducing employees to illegal actions and violation of obligations to the employer	Defect rates	$n \times 100 \div N,$	n – number of faulty products N – total number of products	Khoruzhiy et al (Khoruzhiy et al.: 2019, pp. 69-78),
	equipment downtime and its dynamics for a certain period (year, month)	$t \div T$,	t – downtime in hours T – total number of hours (year, month)	Karzaeva (Karzaeva: 2019, pp. 62-74) Davydova (Davydova: 2019, pp. 98-108)
	the performance index of plan indicators for a certain period	$If \div Ip,$	I_f – actual indicators I_p – plan indicators	Karzaeva (Karzaeva: 2019, pp. 62-74) Davydova (Davydova: 2019, pp. 98-108)
	The proportion of personnel who has created threats through destructive actions	$(Sw \div San) \times 100,$	Sw – number of employees identified as having committed I type of destructive actions for a certain period (month, year); San – the average number of employees for a certain period (month, year)	Glushchenko (Glushchenko et al.: 2018, pp. 87-99)

the unfavorable socio-psychological climate in the workplace; violation of working and rest conditions; violation of regulations	dynamics of labor conflicts in a certain period (year, month)	$Ni + 1 \div Ni,$ $Ni + 1 - Ni,$	n – number of labor conflicts in a certain period; i – number of periods	Karzaeva (Karzaeva: 2019, pp. 62-74) Davydova (Davydova: 2019, pp. 98-108)
	The proportion of personnel who haven't committed violations of work discipline	$(Snv \div S) \times 100,$	Snv – number of employees who haven't committed violations of working discipline; S – total number of staff	Khoruzhiy et al (Khoruzhiy et al.: 2019, pp. 69-78),
	increase in the number of violations of labor discipline in a certain period (year, month)	$Svi + 1 \div Svi,$ $Svi + 1 - Svi,$	Sv – the number of personnel having committed violations of labor discipline; i – period number	Karzaeva (Karzaeva: 2019, pp. 62-74) Davydova (Davydova: 2019, pp. 98-108)
- staff turnover; - staff "critical mass" having attained the retirement age, staff aging;- mistakes workforce planning; - lack of human resources reserve	the proportion of dismissals for various reasons	$(Sdi \div San) \times 100,$	Sdi – dismissals for I reason; San – average staff number	Snitko et al.: (Snitko et al.: 2016, pp. 9-20)
	Staff turnover rate	$(Sd \div San) \times 100,$	Sd – number of dismissals for the reported period San – average staff number for a certain period	N.V. Borovskikh, E.A. Kipervar (Borovskikh, 2018) Denisova & Kobenko (Denisova & Kobenko: 2018, pp. 186-190); Khoruzhiy et al (Khoruzhiy et al.: 2019, pp. 69-78), al., 2019), Tsvetkova & Klevets (Tsvetkova & Klevets: 2017, 163-169)

	the share of employees over 50 years	$(S \geq 50 \div S) \times 100$ ($S_{>50}$ / S) * 100,	$S_{>50}$ number of employees over 50 years; S – total staff number	(Zhivaikina: 2017, p. 403)
	Staffing level	$Sf \div Sn$,	Sf – the actual number of staff; Sn – required number of staff	Khoruzhiy et al (Khoruzhy et al.: 2019, pp. 69-78),
	the proportion of personnel who were hired but did not pass the probation period due to qualifications and labor mismatch or for other reasons	$(Sd \div S) \times 100$,	SP – number of newcomers fired after the probation period; S – total number of newcomers	Snitko et al. (Snitko et al.: 2016, pp. 9-20)

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