

# EVALUATION OF COMPLEX INDICATOR OF ID-PROFILES OF ENTERPRISE STAFF: ECONOMIC APPROACH

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**Abstract.** The article presents the author's method of estimating the complex indicator of ID-profiles of the company's personnel, developed on the basis of the economic approach. It is proved that the concept of "personnel security" is a process of identifying and neutralizing the impact on the economic security of the enterprise of various risks and threats associated with the actions and / or inaction of staff. It is established that the "personnel security system" is a set of interrelated relations between staff and owners (managers) to neutralize threats to the economic security of the enterprise. The concept of "personnel security management" is proposed, which should be understood as management actions of owners (management) to identify and neutralize the impact on the economic security of the enterprise of various risks and threats associated with the actions and / or inaction of staff. The own scheme of a technique of estimation of a complex indicator of ID-profiles of personnel of the enterprise which consists of four stages is offered that allowed to give offers on improvement of stages of an estimation of interdependence of the personnel enterprise which is built on set of departments of the enterprise. Developed adequate methods for assessing and modeling indicators of the personnel security system of the enterprise, in terms of structure and dynamics of personnel, wages and productivity, social indicators, level of education and qualifications, job organization and labor process and indicators related to the personnel component information security.

**Keywords:** personnel security, personnel of the enterprise, management, ID-profile of the personnel, indicators of the profile of the employee.

**JEL Classification:** J01, J50

**Formulas:** 10; **fig.:** 2; **tabl.:** 0; **bibl.:** 15

**Introduction.** Businesses must be able to withstand the negative factors of the market environment and recover from their onset. Therefore, the profitable economic activity of the enterprise involves the creation and establishment of an effective system of various measures of economic security, special attention in this process should be paid to staff.

Personnel security is a component of economic security of the enterprise, which should be considered as the impact of negative conditions under which dangerous factors affect the personnel management system and the level of profit. The personnel security system of the enterprise is focused on the detection of possible internal and external threats, as well as their minimization, such as the detection of conflicts, cases of bribery, incompetent performance of professional duties by employees. Note that to manage the personnel security system of the enterprise, it is necessary to develop a methodology for its evaluation. Therefore, this problem is relevant and needs further study.

**Literature review.** Overview publications of domestic scientists I. Blank, S. Vasilchenko, A. Lupus, P. Haidutsky, M. Kamface, A. I. Mihus and foreign authors: D. Artemenko, A. Bocciarov, B. Rayzberg, V. Senchagov, I. Tkachuk, A. Shavayev - showed a superficial study of the problem of management personnel security. However, despite the large number of scientific papers devoted to the issues

of personnel security of the enterprise, the issues of estimating the complex indicator of personnel ID-profiles remain almost unexplored.

**Aims.** The purpose of the article is to develop and characterize the method of estimating the complex indicator of ID- profiles of the company's personnel based on the economic approach.

**Methods.** The author used the methods of static and logical comparison, systematization and generalization, which made it possible to achieve the goal of the study.

**Results.** The main productive force of any enterprise are employees of the enterprise (personnel), who create tangible and intangible benefits.

Under the term "personnel security" we understand the process of identifying and neutralizing the impact on the economic security of the enterprise of various risks and threats associated with the actions and / or inaction of staff.

Instead, the "personnel security system" is a set of interconnected relations between staff and owners (managers) to neutralize threats to the economic security of the enterprise.

The term "personnel security management" is proposed to mean the managerial actions of owners (management) to identify and neutralize the impact on the economic security of the enterprise of various risks and threats associated with the actions and / or inaction of staff.

Based on the study, the main elements of the personnel security system of enterprises were systematized, which include: facility (staff); subjects of personnel security; decision-making mechanism in the personnel security system of enterprises.

Planning of organizational and technical development and further functioning of the whole enterprise should be based on the following principles:

- practicality;
- high scientific potential;
- comprehensive approach to evaluation;
- continuity of application of the offered mathematical device.

The introduction of advanced technologies, scientific methods or algorithms, automation of production and activities includes measures to implement advanced scientific and technological methods, new modern equipment, integrated automation of production, the concept of personnel security of the enterprise [2; 4].

The introduction of modern scientific methods and approaches includes measures to apply and improve the division and cooperation of labor, organization and maintenance of jobs, the introduction of best practices and methods of work, personnel evaluation system, improving rationing and remuneration.

The combination of the personnel of the enterprise in the labor process in time is provided by various forms of assessment of the complex indicator of ID-profiles of the personnel of the enterprise, the organization of service of workplaces, establishment of rational modes of work.

Research and development, scientific modern methods and approaches are planned called ' connection with the development of new technologies, equipment, highly efficient means of production automation and building ID-profile staff and its

divisions or departments, processes, forms of production and labor, as well as new products.

There is a clear relationship between personnel and organizational development, which is complemented by the effectiveness of economic, environmental, social, labor and regulatory areas at several stages of enterprise development.

Having studied the works [3; 5; 6; 7; 10; 11], it is established that the main modern trends in personnel development are:

- acceleration of individual (deconcentration cooperation, conversion, diversification) and strengthening *vzayemopov* related economic, environmental, social, labor and regulatory areas, providing *demopolizatsiyu* ID-profile staff and its divisions or departments, competition performance market, multiplier efficiency of enterprises ;

- development and application of collective (departments or divisions) forms of organization and pay staff that, subject to the acceleration of enterprise development, quality improvement and complication of logistics enterprises is about ' objectively necessary and economically feasible;

- strengthening the continuity and flexibility of staff assessment in many industries through the widespread use of modern scientific methods and approaches, automated systems and flexible production systems that minimize the loss of time and labor, repeatedly increase its productivity, significantly accelerate product upgrades, manufactured at the enterprise;

- formation of new types of modern scientific methods, approaches and their elements in the process of enterprise, science and production, application of methods of evaluation of ID-profiles of personnel and its divisions or departments on the basis of joint intersectoral and interstate enterprises, scientific and technical developments, created human resources , increasing the efficiency of human resources;

- improving the organization of divisions or departments on the basis of joint intersectoral and interstate enterprises, the transition of the latter to market economic relations with the state and other counterparties, which increases responsibility for the final results of personnel, competitiveness in global and national markets, financial stability and profitability;

- activation of the human factor through the use of methods for assessing the ID-profiles of personnel and its units or departments on the basis of joint intersectoral and interstate enterprises, which meets modern requirements for proper selection of managers at all levels, increasing their competence, efficiency and responsibility; requirements for further development and management of production, ensuring proper organization and executive discipline.

At the present stage of development of the personnel security system of the enterprise, the limited economic, environmental, social and labor and regulatory means of satisfying the interests of the staff are supplemented by the limited methodological basis for assessing the complex indicator of ID-profile in the company's staff.

The problem of evaluating the ID-profiles of staff and its divisions or departments on the basis of joint intersectoral and interstate enterprises to determine

possible ways to improve it, because the desired positive staff is of great importance for any company. Strong staff becomes a necessary condition for the company to achieve sustainable and long-term business success.

To date, there is no universal clear methodology for evaluating the ID-profiles of staff and its units. For example, the effectiveness of the activities of the formation of social interdependence bonds is estimated in several ways: counts the number of proposed ads; the coefficient of advertising application of the volumes of published data is estimated; the number of publications dedicated to the company or individual employee of the enterprise is counted.

The method of assessing the complex indicator of ID-profiles of the company's staff is based on a comprehensive analysis of personnel security indicators to identify potential threats to personnel security at the company and can be used by ministries (eg, Ministry of Economy of Ukraine) and individual departments for integrated assessment of personnel security. In general, by economic factors and by separate spheres (directions) of activity of the enterprise.

Terms [8; 9; 12; 13; 14; 15], used in the method of estimating the complex indicator of ID-profiles of the personnel of the enterprise, have the following meanings:

- personnel security is a state of the enterprise's economy that allows to maintain resilience to internal and external threats to the staff and is able to meet the needs of the enterprise; is the most important functional component of the system of economic security of all enterprises, neglect of which can not only cause significant damage to their activities, but also destroy it; is one and the components of economic security (along with others - financial, power, information, technical, technological, legal, economic and etc.).

- threats to personnel security is a set of existing and potentially possible phenomena and factors that create a danger to the realization of personnel interests in the economic sphere;

- criteria of personnel security are real statistical indicators, which are used to assess the state of the personnel of the enterprise, in terms of ensuring its sustainable development;

- indicators of personnel security - are real statistical indicators of staff development of the enterprise, which most fully characterize the phenomena and trends in the functioning of the components of the economic security system of any enterprise;

- optimal values of indicators are an interval of values within which the most favorable conditions for reproducible processes in the field of functioning of components of system of economic safety of any enterprises are created;

- threshold values of indicators are quantitative values, violation of which causes unfavorable trends in the functioning of the components of the economic security system of any enterprise;

- limit values of indicators are quantitative values, violation of which causes threatening processes in the field of functioning of the components of the economic security system of any enterprises.

Based on previous studies of available methods and techniques [2; 14; 15] , in fig. 1 the author presents his own scheme of methods for estimating the complex indicator of ID-profiles of the personnel of the enterprise.

Stage 1. Definition of individual indicators, which are the basis for calculating the general indicators of the structure and dynamics of personnel, wages and productivity, social indicators, level of education and skills, job organization and labor process and indicators related to the personnel component of information security of ID-profiles of the personnel of the enterprise.

Stage 2. For certain indicators of the structure and dynamics of personnel, wages and productivity, level of education and qualifications associated with the personnel component of the ID-profiles of personnel of the enterprise, it is necessary to calculate their actual values from enterprises for which laws have been defined distribution and ranges of their values.

Stage 3. Calculation of individual performance parts business for components of the structure and dynamics staffing, pay and its performance, social indicators, education and training, and workplace safety and process indicators full related to information security personnel component ID-profiles personnel of the enterprise.

To calculate the overall performance of the structure and dynamics of staffing, pay and its performance, social indicators, education and training, workplace and labor process and indicators full related to human resources component of information security ID-profile staff of the enterprise , it is appropriate to use indicative-geometric method proposed by Kavun S.V. [1].

Calculation of individual indicators of the structure and dynamics of staffing, pay and its performance, social indicators, education and training, workplace and labor process and indicators full related to human resources component of information security ID-profile staffing company, was based on relevant reporting of enterprises.

Due to a small sample of enterprises, to confirm the statistical sufficiency and ensure the representativeness of the processed data, the number of studies (or experiments) in modeling on real enterprise data was increased, which will confirm the adequacy of the model used.

The general logical direction of optimization is the choice of the best (the rule "the greater the value - the better") and further rating of the remaining indicators, ie sorting in descending order. In mathematical interpretation, we have the direction of many indicators of the structure and dynamics of personnel:

That same e, orientation set of indicators pay and its performance:

$$F_1\{X_{i,j}\} \equiv opt \rightarrow max, \forall i = \overline{1,14}, j = \overline{1,18}, \quad (1)$$

where:  $i$  - the number of indicators of the structure and dynamics of personnel;  $j$  - is the number of enterprises (in this case, the number of departments selected as the average - 18).

Thus, the focus of many indicators of wages and its productivity:

$$F_2\{X_{i,j}\} \equiv opt \rightarrow max, \forall i = \overline{1,19}, j = \overline{1,18}; \quad (2)$$

orientation of many social indicators:

$$F_3\{X_{i,j}\} \equiv opt \rightarrow max, \forall i = \overline{1,22}, j = \overline{1,18}; \quad (3)$$

orientation of many indicators of level of education and qualification:

$$F_4\{X_{i,j}\} \equiv opt \rightarrow max, \forall i = \overline{1,20}, j = \overline{1,18}; \quad (4)$$

the orientation of many indicators of the organization of jobs and the labor process:

$$F_5\{X_{i,j}\} \equiv opt \rightarrow max, \forall i = \overline{1,15}, j = \overline{1,18}; \quad (5)$$

orientation of the set of indicators related to the personnel component of information security ID-profiles of the personnel of the enterprise:

$$F_6\{X_{i,j}\} \equiv opt \rightarrow max, \forall i = \overline{1,20}, j = \overline{1,18}. \quad (6)$$

For more about subjective assessment indicators should determine their orientation optimization in terms of both internal and external environment. Will depend on, normalized or correlated indicators. For indicators with the rule "the more - the better", the rationing of values is used to bring them to a single physical nature, in this case to dimensionless coefficients.

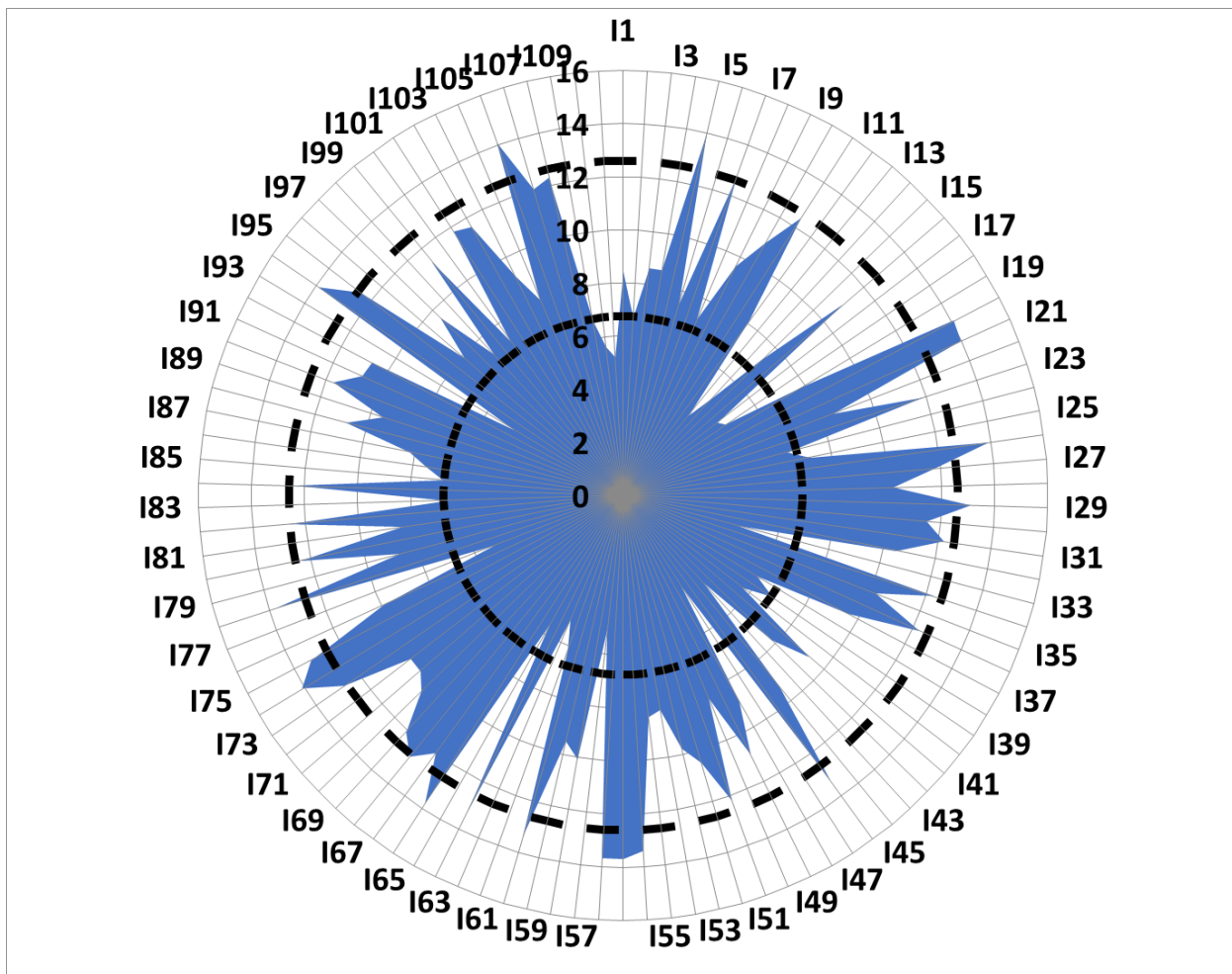
For indicators with the rule "the less - the better", the correlation is performed, as their logical orientation does not coincide with the direction of functional optimization. This full connected with the fact that their logical orientation is different from the general direction, which, in return, subject to the rule "the more - the better" [3; 4; 6].

$$\begin{aligned} X_{i,j}^c &= \frac{(1 - X_{i,j}^N)}{m - 1} \left| opt\{X_{i,j}^N\} \neq opt F\{X_{i,j}^N\} \Rightarrow F\{X_{i,j}^N | X_{i,j}^c\} \equiv F\{X_{i,j}^N\}, \right. \\ &\quad \forall \{X_{i,j}^N\} \Rightarrow \exists \{X_{i,j}^c\}, \{X_{i,j}^c\} \equiv \{X_{i,j}^N\}, \{X_{i,j}^c\} \subseteq \{X_{i,j}^N\}, \\ &\quad \{X_{i,j}^N\} \cup \{X_{i,j}^c\} \subseteq \{X_{i,j}\}, \forall i = \overline{1,n}, j = \overline{1,m} \\ &\quad \sum_{j=1}^m X_{i,j}^c = 1, \sum_{j=1}^m X_{i,j}^N = 1, X_{i,j}^N = \overline{0,1}, X_{i,j}^c = \overline{0,1}. \end{aligned} \quad (7)$$

Therefore, it is appropriate to compare the correspondence of the general logical optimization (in this case it is maximization) and the direction of optimization of each indicator in terms of internal and external environment of the enterprise.

Thus, for some defined indicators it is necessary to correlate their values. For all other indicators, we will also normalize.

Next, petal diagrams (in which the number of petals corresponds to the number of indicators of each of the components in terms of interests of participants in internal and external business processes) for each department of the enterprise for each of the six components: structure and dynamics of staff, pay and productivity, social indicators, education and training, and workplace safety and process indicators fu ' related to information security personnel component ID-profile staffing company. For example, one of the obtained diagrams is presented (Fig. 1).





In order to calculate ratios taking into account interests of internal and external business processes components of the structure and dynamics of staffing, pay and its performance, social indicators, education and training, workplace and labor process and indicators full related to human resources component information security ID-profiles of the personnel of the enterprise, it is necessary to calculate the area of polygons. The indicative-geometric method was used for this purpose [1].

Based on the defined area polygons will be calculated indicators of the structure and dynamics of staffing, pay and its performance, social indicators, education and training, workplace and labor process and indicators full related to human resources component of information security ID-profile staff enterprises. The area  $j$ -th polygon is the sum of squares  $i$ -th triangles –  $S_{i,j}^{\Delta}$ , that his form. The number of triangles is equal to the number of individual indicators.

$$S_{i,j}^{\Delta} = \frac{1}{2} \{X_{i,j}^N | X_{i,j}^C\} \times \{X_{i+1,j}^N | X_{i+1,j}^C\} \times \sin \frac{360}{n}, \forall i = \overline{1, n}, j = const \quad (8)$$

The only exception is the last triangle, the area of which is equal to:

$$S_{n,j}^{\Delta} = \frac{1}{2} \{X_{n,j}^N | X_{n,j}^C\} \times \{X_{1,j}^N | X_{1,j}^C\} \times \sin \frac{360}{n}, j = const. \quad (9)$$

then the area of the  $j$ -th polygon is defined as:

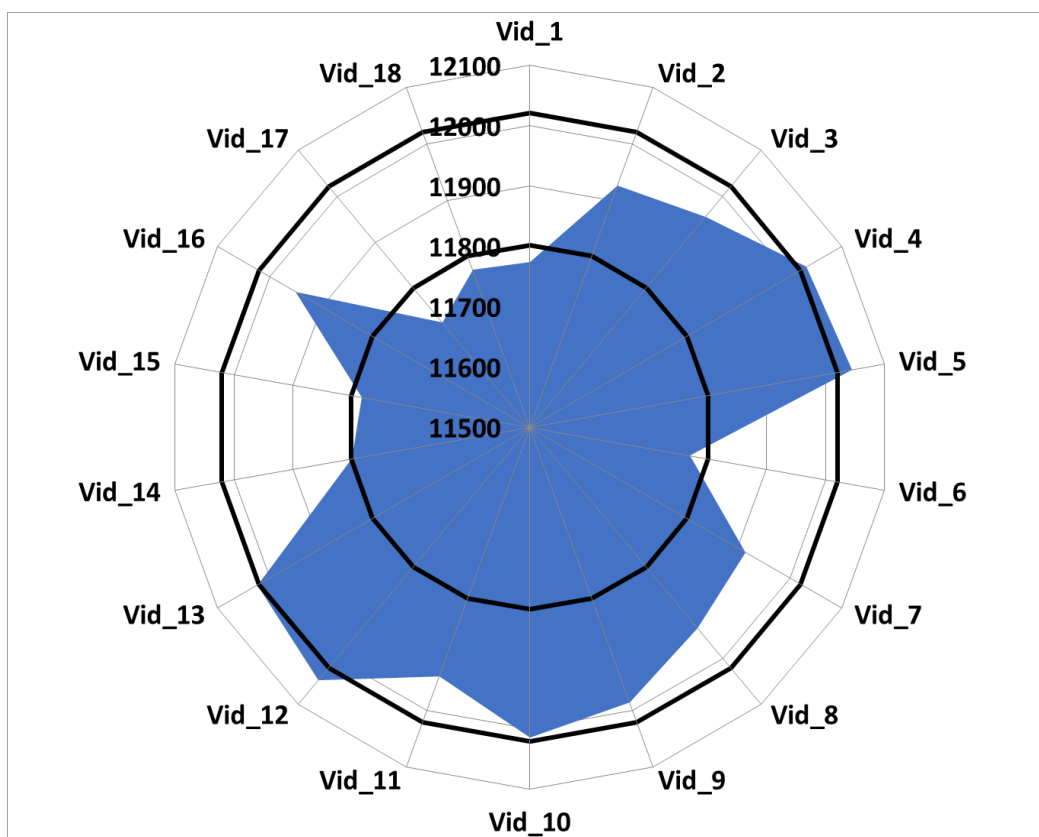
$$S_j^P = \sum_{i=1}^{n-1} \left( \frac{1}{2} \{X_{i,j}^N | X_{i,j}^C\} \times \{X_{i+1,j}^N | X_{i+1,j}^C\} \times \sin \frac{360}{n} \right) + \frac{1}{2} \{X_{i,j}^N | X_{i,j}^C\} \times \{X_{1,j}^N | X_{1,j}^C\} \times \sin \frac{360}{n}, \forall i = \overline{1, n}, j = \overline{1, m}. \quad (10)$$

Therefore, the calculated areas of polygons for each of the components, taking into account the interests of participants in internal and external business processes are the initial data for calculating the value of a complex indicator of ID-profiles of personnel of the enterprise. Given that the company invests its own funds and resources in order to increase the level of a comprehensive indicator of ID-profiles of the company's staff, and the result is obtained from the outside, the calculation of components will be carried out consistently.

Thus, by the ratio of the coefficients of consideration of the interests of the participants of internal and external business processes, the value of the complex indicator of ID-profiles of the personnel of the enterprise for each of its departments is determined (Fig. 2).

Each side of the enterprise is increasingly under the scrutiny of the world community and all states. This applies to enterprises in all forms of ownership, any field of activity, regardless of their geographical location. Tom in, in today's economy more and more companies are beginning to focus attention on the problems of assessment of complex index ID-profile staff of the company, prepare reports of their activities and to assess the level of staffing your company and competitors.





**Figure 2. The value of the complex indicator of the ID-profile of the personnel of the enterprise for each of its departments**

*Source: developed by authors*

**Discussion.** So, for whole Indicator ID-profile staff of the enterprise consists of 110 common indicators of structure and dynamics of staff, wages and productivity, social indicators, education and training, workplace and labor process and indicators full related to personnel component of information security of ID-profiles of personnel of the enterprise. General indicators are calculated on the basis of individual indicators selected by the expert method, according to the interests of participants in internal and external business processes of the enterprise. The calculation of general indicators is based on the indicative-geometric method. The coefficient of assessment of the point of view of interests of participants of internal business processes and the coefficient of assessment of the point of view of interests of participants of external business processes are determined. This ratio full connected with the fact that the company operates only getting results from the external environment, that is satisfying the interests of the participants not only internal business processes (managers, employees), but also external (shareholders, customers, suppliers, local community, state).

Given that there are more participants in external business processes, they are a priority for the company.

**Conclusions.** The term "personnel security management" is proposed to mean the managerial actions of owners (management) to identify and neutralize the impact

on the economic security of the enterprise of various risks and threats associated with the actions and / or inaction of staff.

The own scheme of a technique of estimation of a complex indicator of ID-profiles of personnel of the enterprise which consists of four stages is offered, that has allowed to give offers on perfection of stages of an estimation of interdependence of the personnel enterprise which is built on set of departments of the enterprise.

The own scheme of a technique of estimation of a complex indicator of ID-profiles of personnel of the enterprise which consists of four stages is offered:

Stage 1. Definition of individual indicators which are a basis for calculation of the general indicators of structure and dynamics of personnel, payment and productivity.

Stage 2. Determination of indicators of structure and dynamics of personnel, remuneration and productivity, social indicators, level of education and qualification, organization of jobs and work process and indicators related to the personnel component of information security of ID-profiles of personnel of the enterprise.

Stage 3. Calculation of individual indicators of departments of the enterprise by components of the structure and dynamics of personnel, wages and productivity, social indicators, level of education and qualifications, organization of jobs and labor process and indicators related to the personnel component of information security ID-profiles personnel of the enterprise.

Stage 4. Calculation of the areas of the received polygons which values will form the general value of a complex indicator of ID-profiles of personnel of the enterprise.

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