

# PERSONNEL MANAGEMENT SYSTEM BASED ON A HOLISTIC APPROACH: FORMATION AND DEVELOPMENT IN THE CONTEXT OF ENSURING INNOVATIVE DEVELOPMENT OF MOTOR TRANSPORT ENTERPRISES

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## ABSTRACT

In the market economy, important changes are taking place in the management of the organization (enterprise), the role of the human factor, the value and importance of working with personnel is increasing. The primary importance in the competitive struggle is occupied by the employee – the "working man", its human, social and intellectual potential. In this regard, personnel management becomes the predominant type of activity against the management of other objects, the basis of the organization's management system. Personnel management activities permeate all processes of the company's functioning, are implemented in all subsystems (functional and target – we are talking about operational activities for personnel assessment, motivation of employees to perform certain tasks, etc.).

Practice shows that the implementation of functions and procedures related to personnel selection, their assessment, career planning, reserve training, etc. separately does not give the desired result, since the connection with the organization's strategy and the focus on achieving the main goals are not fully ensured. Therefore, the formation of an effective personnel management system at the enterprise, which meets the conditions of operation, is able to ensure the achievement of the set goals and quickly adapt to changes in the external environment, is of great importance. Therefore, there is a need for the formation of such a personnel management system of the organization, which would ensure the implementation of the strategic goals of the enterprise as effectively as possible; corresponded to the state of the external and internal environment; the possibility of flexibility in the implementation of functions and management methods, etc.

## KEYWORDS

Personnel, human factor, integrity, holistic approach, personnel management, strategy.

## 5.1 PERSONNEL MANAGEMENT: ANALYTICAL AND METHODOLOGICAL FOUNDATIONS

In modern literature and practical activity, a sufficiently large number of studies have been conducted regarding the methods of forming the personnel management system, its "embeddedness" in the general structure of enterprise management. In modern studies, attention is paid to the search for new approaches to the formation and functioning of the personnel management system.

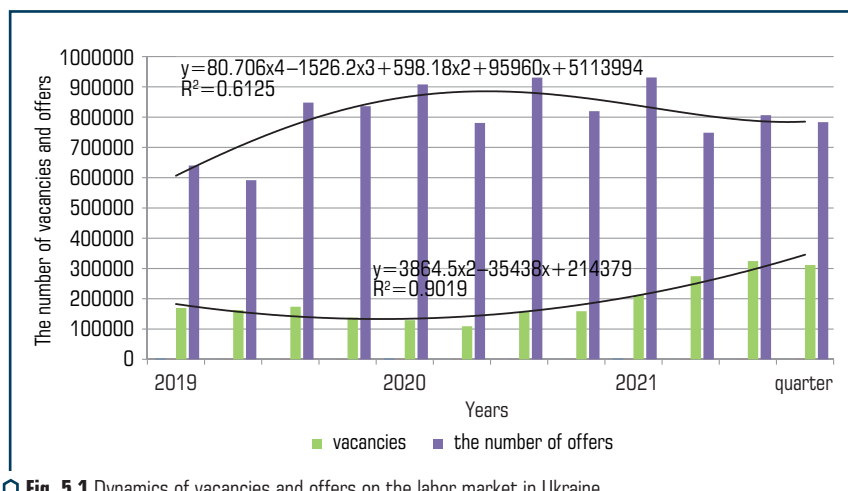
Many studies that have a practical orientation are primarily related to the quantitative assessment of the need for workers in various industries and types of economic activity, analysis of vacancies and the need for strategic planning of training of specialists, etc.

The dynamics of supply and demand on the labor market in Ukraine (**Fig. 5.1**) shows that supply exceeds supply in all periods of the studied population (quarters for the years 2019–2021). So, in 2020, in the 1<sup>st</sup> and 2<sup>nd</sup> quarters, such an excess was 7 times. Then the situation improved somewhat and in 2021 it decreased from 4 times in the first quarter to 2 times. The transport sector accounts for 11 % of the need for personnel from the total number of vacancies. The study of the trends of these indicators shows that there is a polynomial relationship, which allows to calculate forecast changes according to the corresponding equations (marked in **Fig. 5.1**).

As for 2022 (the period of hostilities on the territory of Ukraine), the number of vacancies (as of September 30, 2022) averages 87.18 thousand, which is 13.4 thousand or 18.15 % more than in the previous month (as of August 30, 2022). The average number of posted resumes is 464.22 thousand and 487.94 thousand, respectively, which indicates a decrease of 23.72 thousand, or 4.86 %. Again, the number of offers exceeds the number of vacancies by 6 times.

The results of a comparative analysis of the main labor indicators in Ukraine as a whole in comparison with the transport sector are shown in **Table 5.1**.

According to the **Table 5.1**, it should be noted an unstable trend regarding the employment of workers, both in Ukraine as a whole and in the transport sector. So, in 2013, the number of employed workers was 7,406,494, and in 2016, it was 5,801,140 people – a negative trend of reducing the number of employed people in the economy. Starting from 2017 to 2021, there is a slight positive trend towards an increase in the number of employed persons.



**Fig. 5.1** Dynamics of vacancies and offers on the labor market in Ukraine  
Source: author's development

● **Table 5.1** Comparative analysis of labor indicators (based on official statistics)

Indicator	Years								
	2013	2014	2015	2016	2017	2018	2019	2020	2021
Number of employed workers – Ukraine	7406.5	6298.5	5889.7	5801.1	5812.9	5959.5	6407.5	6366.1	6391.7
by section H*	911.5	762.3	776.5	765.2	764.2	762.3	758.1	729.4	710.0
Chain growth rates (Ukraine on), %	–	–15.0	–6.5	–1.5	0.2	2.5	7.5	–0.6	0.4
Chain growth rates by section H, %	–	–16.4	1.9	–1.5	–0.1	–0.2	–0.6	–3.8	–2.7
Personnel costs, billion UAH – Ukraine	378.2	354.4	392.6	434.8	569.9	727.1	901.2	990.6	1169.8
by section N	51.4	45.0	54.8	62.3	82.3	106.4	123.4	122.9	137.5
Chain growth rates (Ukraine on), %	–	–6.3	10.8	10.7	31.1	27.6	23.9	9.9	18.1
Chain growth rates by section H, %	–	–12.5	21.8	13.7	32.1	29.3	16.0	–0.4	11.9

Note. \* includes data from section H "Transport, warehousing, postal and courier activities"

In the transport sector, a negative trend in the number of employed persons is observed for almost the entire considered period. The rate of reduction in 2014 is the most important – (–16.4 %). The reason for this is the war in Donbas, the annexation of Crimea, the unstable socio-economic and political situation in Ukraine.

An important indicator that characterizes the effectiveness of personnel management is the ratio of profit from a certain type of activity and the corresponding personnel costs, that is, the profitability of the total personnel costs (**Fig. 5.2**).

In general, according to economic indicators in Ukraine, there is a slight reduction in the profitability of aggregate costs (from 8.5 % in 2012, a gradual reduction to 0.8 % in 2020). As for enterprises in the transport sector, an unstable situation is observed here: from 2012 to 2014, a negative trend took place (in 2014, the lowest value of this indicator was recorded (–68.3 %), from 2014 to 2016, a positive trend was observed to increase in the rate of profitability, from 2016 to 2018 – a decrease again. Starting from 2018, a positive trend is noted, 8.9 % was recorded in 2020. It has the following equation for this trend:

$$R=22.123t-47.016, \text{ the reliability of the approximation } R^2=0.7721.$$

Analyzing the growth rates of labor productivity in comparison with the growth rates of personnel costs (Fig. 5.3), it is possible to draw a conclusion about the positive trend in the functioning of transport industry enterprises. In recent years (2019 and 2020), the growth rate of labor productivity exceeds the growth rate of wages.

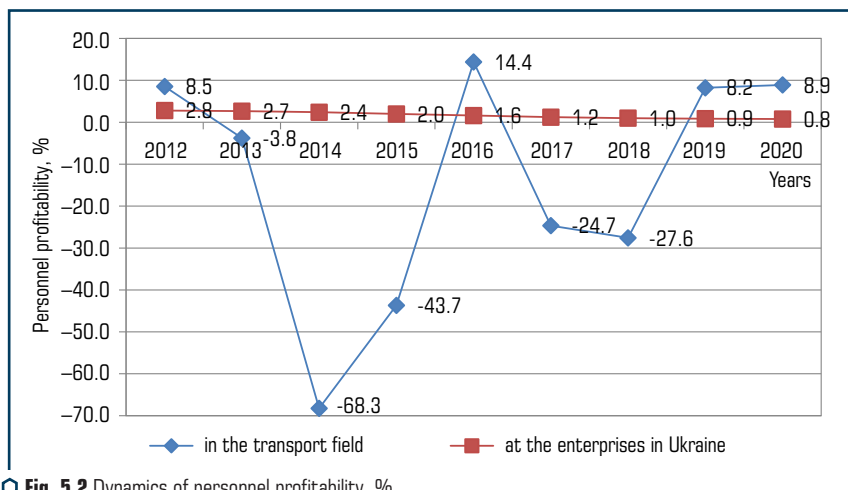


Fig. 5.2 Dynamics of personnel profitability, %

Source: author's development

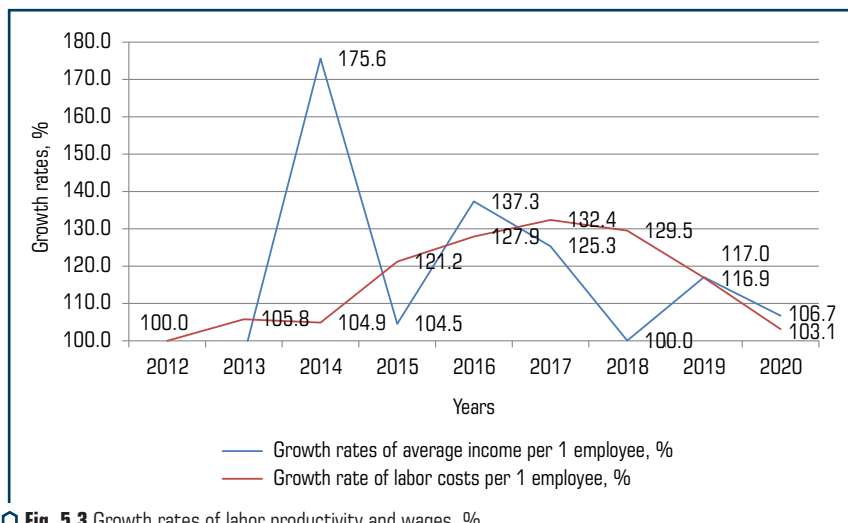


Fig. 5.3 Growth rates of labor productivity and wages, %

Source: author's development

However, in 2022, military actions changed the situation with the functioning and development of transport enterprises. The number of enterprises that have completely stopped their activities has almost halved compared to the beginning of hostilities (from 32 % to 17 %). However, 60 % of enterprises operate below the pre-war level of employment, almost 23 % – more than twice. The port infrastructure is practically paralyzed (sea ports of Berdiansk, Mariupol, Skadovsk, Kherson are closed until control over the territories is restored, and the work of Mykolaiv and Odesa ports is blocked). At the same time, railway and road connections are being restored, and new transportation routes are being introduced.

The conducted analysis proves the necessity of forming a personnel management system as an integral component of enterprise management and is a vital condition for its functioning.

Theoretical studies of the personnel management system mainly relate to the definition of its components, features of formation in modern economic conditions, construction methods in a competitive market environment, etc.

In the most common approach, the personnel management system is considered as a subsystem of the general enterprise management system, which is aimed at the involvement and effective use of existing employees and is based on the performance of specific functions distributed among the personnel of the management apparatus [1]; subsystem of managing the enterprise as a whole, which has a purpose, content and a certain mechanism. The purpose of the personnel management system is determined by the mission of the enterprise [2] or as "an ordered set of interconnected elements that differ in functional goals, act autonomously, but are aimed at achieving a common goal" [3]; separately emphasized in the definitions of the personnel management system and its goals – "the personnel management system of the enterprise is a set of goals, tasks and main directions of activity, personnel policy of the enterprise, as well as various types, methods and the corresponding management mechanism, aimed at increasing labor productivity and quality personnel work" [4].

These definitions focus on the fact that the personnel management system implements certain functions aimed at achieving a certain goal and is part of the overall management system.

In the scientific and educational literature, various approaches to the formation of a personnel management system are considered: functional [2, 5, 6]; systemic [3, 7, 8]; process [1, 9].

The first approach involves the functional division of labor in the field of personnel management. According to management theory, namely general management functions "analysis → planning → organization → motivation → control", specific functions of personnel management are distinguished.

In work [2], the most simplified approach to the selection of types of functional activity in personnel management is given: the process of hiring employees, development; individual goals, assessment and motivation of personnel.

The most complete list of such functions is given in the work of Liudmyla Poshelyuzhnaia [6]. These are the following types of functions: personnel analysis and planning; recruitment and hiring of personnel; personnel assessment; organization of training and professional development of personnel; attestation and personnel rotation; personnel motivation; accounting of company

employees; organization of labor relations at the enterprise; creation of working conditions; social development and social partnership; legal and information support of the personnel management process.

At the same time, there is a certain combination of the functions themselves and the provision of the personnel management process, as well as the directions of development of the system itself – social development and social partnership.

When using the system approach, the personnel management system is perceived as a set of different subsystems. At the same time, different types of subsystems are distinguished. For example, the authors of the work [8], based on the understanding of the system of managerial work as a set of goals, forms and methods of effective personnel management, justify the presence of three subsystems. The first is a subsystem of personnel analysis, planning and forecasting aimed at creating facilities and management structures, calculating the need for personnel of the required profession, specialty and qualification. The second subsystem includes the subsystem of selection, placement, assessment and continuous training of personnel, which are considered as a guarantee of the quality of the formed objects of the personnel management structure, as well as effective stimulation. And, the third subsystem is the rationality of personnel use.

It should be noted that this is the simplest and most widespread approach to the allocation of personnel management subsystems. However, this selection of subsystems is quite extensive; there are no subsystems for personnel motivation and personnel accounting.

The approach to the organization of functional subsystems of the company's personnel management system is also quite widespread [9]: subsystem of labor relations; working conditions subsystem; personnel accounting subsystem; personnel planning and forecasting subsystem; personnel development and training subsystem; work stimulation subsystem; creation of the necessary social infrastructure; selection and application of organizational management structures.

A more detailed description of the types of subsystems is contained in the work of Dmytro Korsakov [10], namely, nine such subsystems are provided: C1 – subsystem of personnel analysis and planning; C2 – subsystem of recruitment and personnel accounting; C3 – personnel motivation subsystem; C4 – personnel assessment subsystem; C5 – personnel development management subsystem; C6 – subsystem of creation of working conditions; C7 – information support subsystem of the personnel management system; C8 – subsystem of the development of the organizational management structure; C9 – subsystem of legal support.

A similar list of subsystems of the modern personnel management system is given in [11]: strategic planning; management of social and sustainable development, legal support, subsystem of development of organizational structure and management culture; managing labor relations and ensuring normal working conditions; general and line management; information support and marketing; personnel development management; personnel administration and recruiting activities and personnel accounting; management of stimulation and motivation of personnel.

In our opinion, such an organization of the system is sufficiently complete and practically feasible. The presented list of subsystems of the personnel management system and their content are

universal, as they are aimed at large organizations with broad financial capabilities. But there is a mixing of subsystems of personnel management, which provide for the implementation of functions on a permanent basis, and subsystems of the development of this work, namely C8 and the subsystem of the development of organizational structure and management culture. Also, in our opinion, a separate place should be occupied by subsystems related to ensuring the functioning of the personnel management system (C7, C9) and information support and marketing, etc.

The general drawback of functional and systemic approaches to the formation of a personnel management system is the lack of mapping of the relationship between functional blocks or subsystems, the order of implementation of management functions is not determined.

Considering the functions of personnel management as a series of interdependent continuous actions is assumed by the process approach. The personnel management system is presented as a relationship of processes united in three blocks: "launch", "processes", "release". "Launching" involves hiring, selection, negotiations, concluding a contract. The "processes" block includes training, training, working conditions, medical care, conflict prevention and resolution, termination of employment. And the "output" block is perceived as the output of the system and provides for the execution of work.

When applying a process approach to personnel management, it is necessary to take into account that this process is not localized within one unit, it is implemented in different units of the organization, it is end-to-end.

Studies of existing approaches to personnel management systems show that when they are formed, there is no interconnection with the organization's management system, its strategy, the goals of the main activity; in some cases, the object of management is not defined: an individual is an employee, a group of employees; the team in general. All this requires improvement of the personnel management system of the organization.

## **5.2 PERSONNEL MANAGEMENT FROM THE POSITION OF A HOLISTIC APPROACH**

The focus of personnel management on ensuring the strategic goals of the enterprise ensures the use of a holistic approach. In the most general case, the term "holism" comes from the Greek "ὅλος" and means "whole", "make whole".

Regarding the application of holism in management, this is a new approach. Theoretical and methodological aspects of holistic management have just begun to take shape. At the same time, the object for the application of a holistic approach is tasks that cannot be effectively solved using traditional management methods. The authors [12, 13] call the following the main differences of holistic management: prioritizing the involvement of all participants in the development and implementation of management decisions; absence of the need to detail the system, but its perception as a whole, despite any level of complexity and the presence of differences in individual components; maintaining feedback; reducing the distance in the relationship between management personnel and

other groups of employees of the enterprise; decentralization; taking into account the influence of macro- and microenvironmental factors.

Despite the fact that the holistic approach is quite new, there is some development and research in the direction of its application in personnel management.

Holistic personnel management is considered as a general approach to the management of human resources in accordance with the strategic vectors of the company's activity, which is closely related to the strategic management of the enterprise. This approach is an effective way to ensure system performance by considering human resource management (HRM) from a more holistic and balanced perspective, including organizational climate, culture, etc. [14]. From the point of view of the authors of the work [15] the HRM model should ensure the achievement of multifunctional goals of the organization, as well as the achievement of individual goals of each individual employee, take into account the impact of the organization on the external and internal environment. A holistic approach to HR [16] also includes, along with traditional elements of personnel management (HR philosophy, strategy, HR processes, which include formal procedures and methods used to implement strategic plans and policies), the implementation of the concept of individual resources of employees from the point of view great time pressure, work overload, professional stress and the threat of burnout.

The paper [17] examines the basics of holistic personnel management and emphasizes the fact that "a feature of the holistic approach to personnel management is the integration (technical, technological, informational, methodological and economic) of individual subsystems into a single system that provides end-to-end management of all types of flows: labor, material, financial, informational, service, marketing and sales". In the opinion of these authors, with which one should fully agree, the application of a holistic approach to the management of the organization's labor resources should be considered through the prism of the general logistics rule "7R": required personnel (right personnel) in the necessary amount (right quantity) and qualifications (right qualification), which are needed by the structural divisions of the organization (right structural divisions of the organization) at the right time (right time) and place (right place) with the specified level of expenses (right cost).

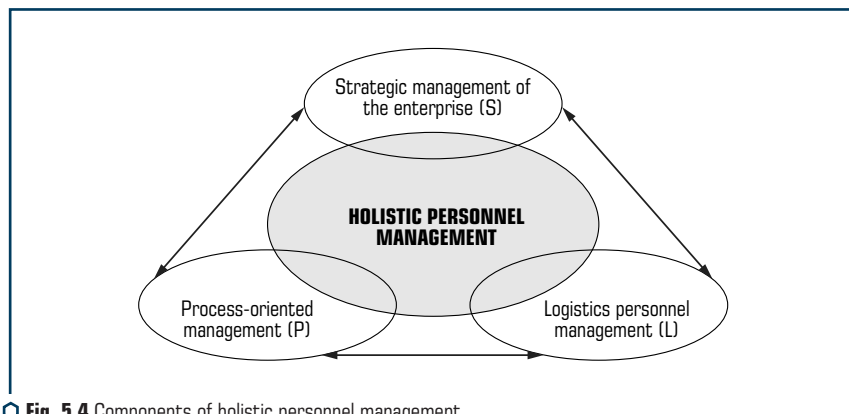
The formation of the company's personnel management system based on a holistic approach is related to the creation of a single system taking into account common features, determining the mutual compatibility of possible subsystems and their coordination mechanisms.

Holistic personnel management, in our opinion, includes a holistic view and signs of the implementation of three components: strategic enterprise management, process-oriented management and logistical personnel management (**Fig. 5.4**).

Strategic management determines how the organization will function and develop, a list of management actions to achieve the desired state, set goals in the long term. Employees should be perceived as the basis of the enterprise, its main value and source of competitiveness.

Strategic management is dominant, and process-oriented and logistical personnel management are derivatives, created to ensure the achievement of strategic goals of the enterprise.





**Fig. 5.4** Components of holistic personnel management  
*Source: author's development*

Process-oriented management is a purposeful activity that allows the enterprise to increase the value of products for consumers, as well as the level of its profitability by focusing on processes and approaches to their internal organization.

Process-oriented personnel management leads to the simplification of multi-level hierarchical organizational structures, which ensures a greater orientation of the organization to the consumer. By reducing the hierarchical levels of the organizational structure, the process approach makes it possible to simplify the exchange of information between different units; eliminate the isolation of units and officials, consider personnel management activities not statically, but dynamically, when the activity in the system must be constantly improved on the basis of appropriate measurements and analysis, focus on the interaction of units and officials, which makes it possible to eliminate "night fields", i.e. areas of activity falling out of the influence of the system.

Logistics management of personnel is considered by us as a process or activity that is subject to defined goals, is carried out in a logical sequence, can be organized at the strategic and tactical levels, is carried out continuously and includes planning, organization, implementation and control of personnel movement; at the tactical level, it includes the process of optimization and rationalization of personnel flows in order to coordinate them with other logistics flows and increase the efficiency of providing and using the company's personnel.

The main tasks of logistics personnel management are to provide the enterprise with the necessary personnel at the required time, in the required quantity and in the required place with costs beneficial for the enterprise.

Holistic personnel management combines these components and provides orientation of the system to the appropriate strategy of the enterprise, the ability to adapt the system to changes in the external environment, the development of horizontal connections that ensure effective interaction of employees and units; cooperation.

In terms of the general theory of systems and their formalization, a personnel management system built on the basis of a holistic approach can be represented as an intersection of three sets of strategic ( $S$ ), process-oriented ( $P$ ), and logistical personnel management ( $L$ ), respectively:

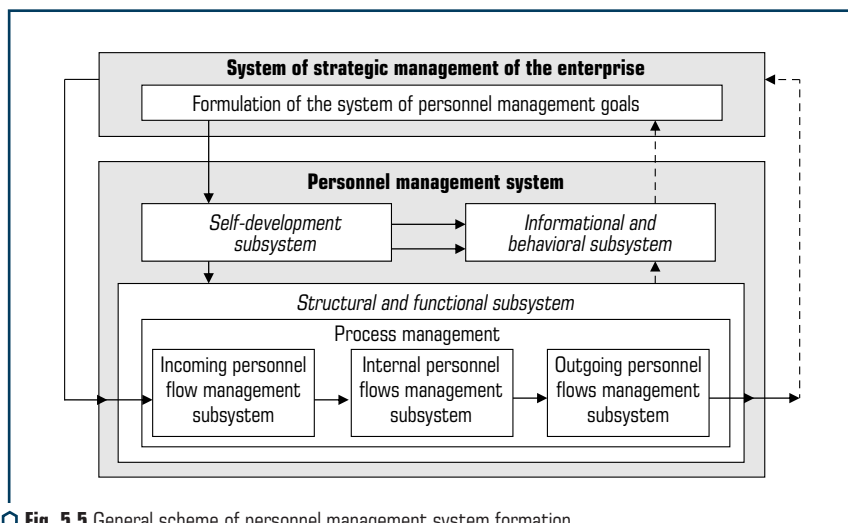
$$S \cap P \cap L = \{D | D \in S \text{ and } D \in P \text{ and } D \in L\},$$

where  $D$  are the elements characterizing the combined features of holistic personnel management;

$$D = \{T, X, U, W, Y, G, h, j\},$$

where  $T$  – a set of time points;  $X$  – a set of possible input influences,  $X = \{x: T \rightarrow \Omega\}$ ;  $\Omega$  – a set of instantaneous values of input influences;  $U$  – a set of states or internal characteristics of the system;  $Y$  – a set of instantaneous values of output signals;  $G$  – a set of initial values,  $G = \{\gamma: T \rightarrow Y\}$ ;  $\eta$  – output display,  $\{\eta: T \times U \rightarrow Y\}$ ;  $\varphi$  – a state transition function,  $\{\varphi: T \times U \times Kh \rightarrow U\}$ .

According to the holistic approach, it is proposed to present the personnel management system as a set of sequentially combined elements (**Fig. 5.5**).



**Fig. 5.5** General scheme of personnel management system formation  
Source: author's development

It is advisable to integrate the strategic management system of the organization into the process management system as one of the top-level processes. For this, a single system of strategic goals is created, and each internal strategic goal and indicator of its achievement must be attributed to a certain process of the system. The identified goals must comply with the SMART principle,

first of all, relate to certain time intervals (Time-based) and be simple, clear (specific), measurable (measurable), agreed upon and focused on specific actions (Attainable), realistic (realistic).

The personnel management system can be represented as a set of structural-functional, informational-behavioral subsystems and self-development subsystem.

The information-behavioral subsystem includes the management ideology and value system of the organization, employee interests and behavioral norms, information support of the management system; subsystem of self-development – changes in the external environment that lead to changes in the management ideology of the organization and the emergence of self-development stimulators. The structural and functional subsystem reflects the connections between the elements of the management entity and implements process management.

The specific content of the structural-functional subsystem is determined by the content of the object in personnel management.

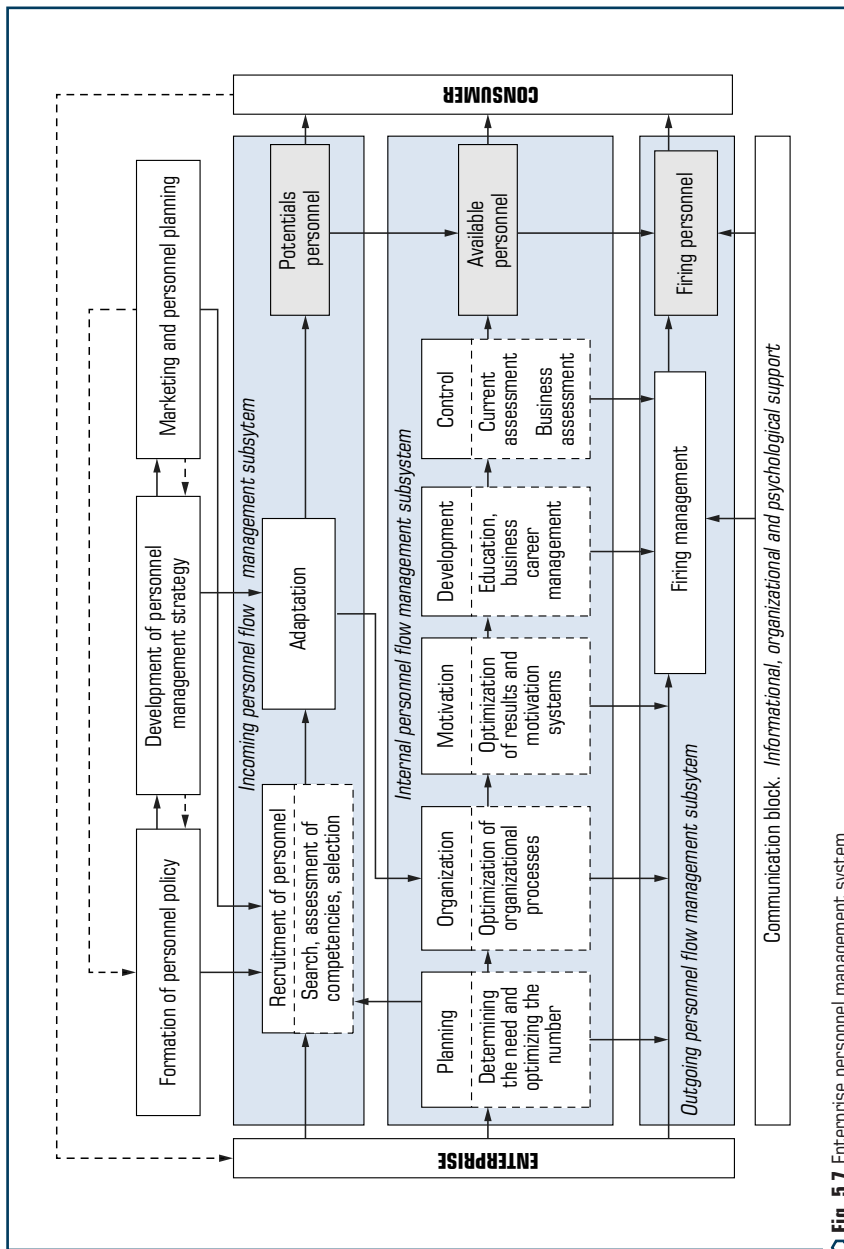
To describe the object in personnel management and its formalization, let's use the canonical model – the representation of the object in the form of "entrance", "black box" and "exit". As "input" it is appropriate to consider the needs and motives of the employee, related to the possibility of their satisfaction in this organization, and "output" – the achieved results (work performed, its significance, involvement in the production process, etc.), that is, significant in the organization, and to an individual employee. In addition, taking into account the logistics approach, the formation of the system should be based on the following principle: the organization is a supplier, and working people are consumers (**Fig. 5.6**).

Having worked during the working day, the employee leaves the organization with its intelligence, which is not material capital. It is an invisible resource that belongs to the employee and can bring success to the organization. Logistics personnel management considers employees not just as a labor force that receives wages, but as an intellectual potential in which the organization is also interested, as in the external consumer. From this point of view, the employee is its client (internal consumer).

In our opinion, it is expedient to present the structural and functional subsystem as part of three subsystems: management of incoming personnel flows, internal personnel flows, and management of outgoing personnel flows (**Fig. 5.7**).

Provider	Exit	Process	Entrance	Consumer
Organization	People's needs (workers) Organization of meeting needs	"Black Box"	Significance of work Reward-based performance Engagement (separation of powers) Mentoring	Workers

**Fig. 5.6** The principle of personnel management system formation  
Source: author's development



**Fig. 5.7** Enterprise personnel management system  
Source: author's development

The main differences of the proposed personnel management system (**Fig. 5.7**) are: firstly, personnel flows should be considered from the enterprise as a supplier of work to the consumer (potential or existing personnel or personnel being laid off); secondly, the main management functions (planning, organization, development, motivation and control of personnel) are used when determining the content of the system; thirdly, the element "information, organizational and psychological support" is included in the components of the system; fourthly, take into account that the optimization of personnel flows is based on a certain set of initial provisions: the personnel system is considered as a complex system that has a number of subsystems; each subsystem has its own criterion of optimality, which reflects its internal (immanent) interests; the functioning of the structure is a process of interaction of these subsystems.

Taking into account management tasks, management ideology and development strategy, a personnel policy is formed and a personnel management strategy is developed, that is, a general direction of work, a course of action to strengthen and preserve the competitiveness of the organization with the help of its employees. On this basis, personnel planning is carried out, organizational and technical measures are developed for the selection and reception of personnel, their development, motivation, assessment and communication. The subsystem of management of incoming personnel flows includes personnel recruitment and adaptation. In turn, when implementing personnel recruitment, it is necessary to search for personnel, assess competencies, and select personnel.

The search for personnel is carried out using the following sources: from the mass media (the use of media space ensures maximum "coverage" of possible applicants and relatively small financial costs. Informational, organizational and psychological support reflects the issue of social and psychological support for personnel management, the implementation of various sociological and psychological procedures in the practice of personnel work at the stage of personnel search and selection. Such procedures should include consultations with a specialist (psychologist) and its participation in interviews, the attachment of a mentor for the adaptation period, the organization of interviews in convenient conditions, etc. This helps to overcome the psychological burden that arise in the course of work, carries out coordination and implementation of decisions that allow avoiding conflicts and stresses.

The internal personnel flow management subsystem includes the performance of the following personnel management functions: planning, organization, motivation, development and control.

At the planning stage, the main attention in the personnel logistics system should be given to determining and optimizing the number of personnel. The actions of the enterprise to optimize the number of personnel are reduced to the following: reduction of employees or their recruitment from the outside; functional adaptation of own employees to changing conditions of production through the use of non-standard working hours; organizational transfers of employees; retraining and professional development; personnel leasing (temporary hiring of labor through relevant organizations).

Optimizing the number of personnel in case of structural inconsistency is carried out by the following method: relocation of employees at workplaces after their retraining; changes of workplaces at the initiative of the administration or the employees themselves; preservation of workers in the event of their underutilization.

The main role of informational, organizational and psychological support in the management of internal personnel flows is to convey the necessary information to the existing personnel about the actions (measures) that the enterprise performs (implements) in relation to its existing personnel, which, in turn, should contribute to retention personnel.

The subsystem of management of outgoing personnel flows provides management of dismissal.

Before starting to lay off employees, it is necessary to use a number of less drastic methods, namely: suspend the recruitment of new employees for jobs that are vacated due to natural turnover of personnel, and fill these positions with your own employees, whose positions need to be reduced. As a rule, such a company is accompanied by retraining of personnel, which is also a temporary way of reducing the intra-organizational labor supply. The enterprise can send its employees to a long period of training with a break from production; transfer of some employees to part-time work, especially in industries with seasonal fluctuations in demand (transport, agriculture, tourism). This will allow to retain qualified employees; voluntary dismissal. Management should encourage voluntary redundancy through a one-time payment and facilitate the search for a new job. The communication unit provides connections between all subsystems.

The practical implementation of the proposed personnel management system of the enterprise involves substantiation of the most expedient variant of its organizational structure. Solving this task is related to the specifics of the enterprise in the relevant industry and the specifics of the management approaches used.

In the enterprises of the road and transport complex, including motor transport enterprises (MTE), linear and functional management structures are mainly used. At the same time, the functions and decision-making rights are entrusted to the linear management units, and to the functional subdivisions – methodical guidance in the preparation and implementation of decisions on the management of MTE activities. Among the MTE services, the main (operational) service – the service of transportation organization; auxiliary (management of car maintenance and repair processes) – technical service; service for maintenance of production – service of the chief mechanic and energy; service of ancillary works (cleaning of premises, territory, etc.). MTE management services include the planning and economic department, the marketing department, the personnel department, etc.

The conducted studies show that within the existing organizational structure of MTE, several options for creating a personnel management system (PMS) can be identified and considered:

- 1) identify the PMS with the personnel department;
- 2) create a PMS on the basis of the personnel department, the planning and economic department and others, which are engaged in the implementation of individual functions of personnel management;
- 3) create a section of strategic personnel management, which is engaged in the implementation and development of personnel management functions in a strategic aspect, and the implementation of these functions in the current work will be entrusted to line managers.

Each of the options has its advantages and disadvantages. Thus, the first option does not require costs for the formation of a new system, redistribution of functions, etc., but does not

ensure the availability and performance of coordinating functions in personnel management, implies low efficiency of these works. PMS on the basis of personnel department, planning and economic department and others engaged in the implementation of individual personnel management functions (the second option) has a high level of coordinating personnel management functions, but requires costs for the formation of a new system, redistribution of functions, etc. The advantage of the third option is the use of the concept of dual or shared responsibility, according to which both line managers and personnel management specialists are responsible for the implementation of the main task – increasing the efficiency of the use of human resources.

To assess the given options, it is advisable to apply the method of prioritization (**Fig. 5.8**).

As criteria for comparing variants of the organizational structure of personnel management, it is proposed to use the following: the effectiveness of the organizational structure, the completeness of the implemented functions of personnel management, social standards and the possibility of MTE implementation. Block 1 is responsible for entering information on the functioning of the personnel management system (the number of organizational options is specified, their content is determined, parameters characterizing the effectiveness of the relevant organization are established). On the basis of the presented information in block 2, objects of pairwise comparison are determined. As objects of comparison, separate versions of the PMS act. It is assumed that  $t$  objects  $A_1, A_2, \dots, A_t$  are compared in pairs by each of  $n$  experts. Then the number of possible pairs for comparison is  $s = t(t-1)/2$ , which is determined in block 3.

Experts express their judgments in the form of pairwise comparisons without quantitative assessment of the degree of superiority in each pair of objects.

The calculated ratio coefficient ( $K_p$ ) is determined by the formula (block 4):

$$K_p = \frac{A_i^{\max}}{A_j^{\min}},$$

where  $A_i^{\max}$ ,  $A_j^{\min}$  is the object with the maximum and minimum importance rating, respectively. As a result, a system of paired comparisons based on a given feature is formed.

The determined values of the coefficients  $X_{ij}$  are the basis for forming a matrix of pairwise comparisons of processes  $A = [X(i, j)]$  – block 5 and 6.

Data processing of the received matrices is performed in block 7 in the following sequence:

- the iterative power of the first order is determined by summing the values of the matrix by row ( $P_i(1) = \sum X_{ij}$ );
- the iterative force of the second order ( $P_i(2) = \sum X_{ij} \cdot P_j(1)$ ) is calculated:

$$p_{s(k)}^{\text{rel}(2)} = \frac{1}{\sum_{s(k)=1}^{S(m)} \sum_{g=1}^G b_{gs(k)} p_g^{\text{rel}(1)}} B p^{\text{rel}(1)},$$

where  $B = \|b_{gs(k)}\|$  is the matrices of comparisons of variants of the organization of the SMP;

$$- \rho^{rel(1)} = \frac{\sum_g b_{gs(k)}}{\sum_{s(k)} \sum_g b_{gs(k)}} - \text{the iterated power of the first order by } s(k)\text{-th comparison indicator;}$$

– determination of the normalized iterative power of the  $i$ -th variant ( $P_i = P_i(2) / \sum P_i(2)$ ).

The value of the normalized iterative power indicates the degree of importance of the corresponding option of the personnel management system. According to the received priority values, the options are ranked in order from more important to less important in block 8, however, they can be accepted for further calculations only if the matrix is transitive and there are no equality relations in it. The check of the set condition takes place in block 9. In this case, two options are possible. If the condition is fulfilled, conclusions are made about the degree of manifestation of the assessed feature in the processes, and the importance values are transferred to block 14. In the opposite case, the ratio coefficients need to be recalculated, based on which the priority values of the comparison objects are adjusted.

Block 10 provides for the calculation of the actual ratio coefficient ( $K_r$ ) based on the actual priority data. At the same time, it is necessary to check the consistency of the actual ratio with the calculated ratio (block 11). If the value of these coefficients is equal, then the problem is considered solved and information about the importance of the PMS options is transferred to block 12. In the opposite case, the value characterizing the increase in the coefficient  $X_j$  needs to be adjusted according to the formula:

$$y' = y \frac{K_r}{K_f}.$$

Block 12 is responsible for the recalculation of this coefficient. Based on the adjusted system of priorities, block 13 forms a matrix with a non-transitive system of comparisons  $A' = [X(i, j)']$ . The determination of the adjusted values of priorities takes place in block 14, and the values of the adjusted normalized iterative power of processes ( $P^i$ ) are accepted for further calculations (block 15).

Absolute priorities regarding the proposed options:

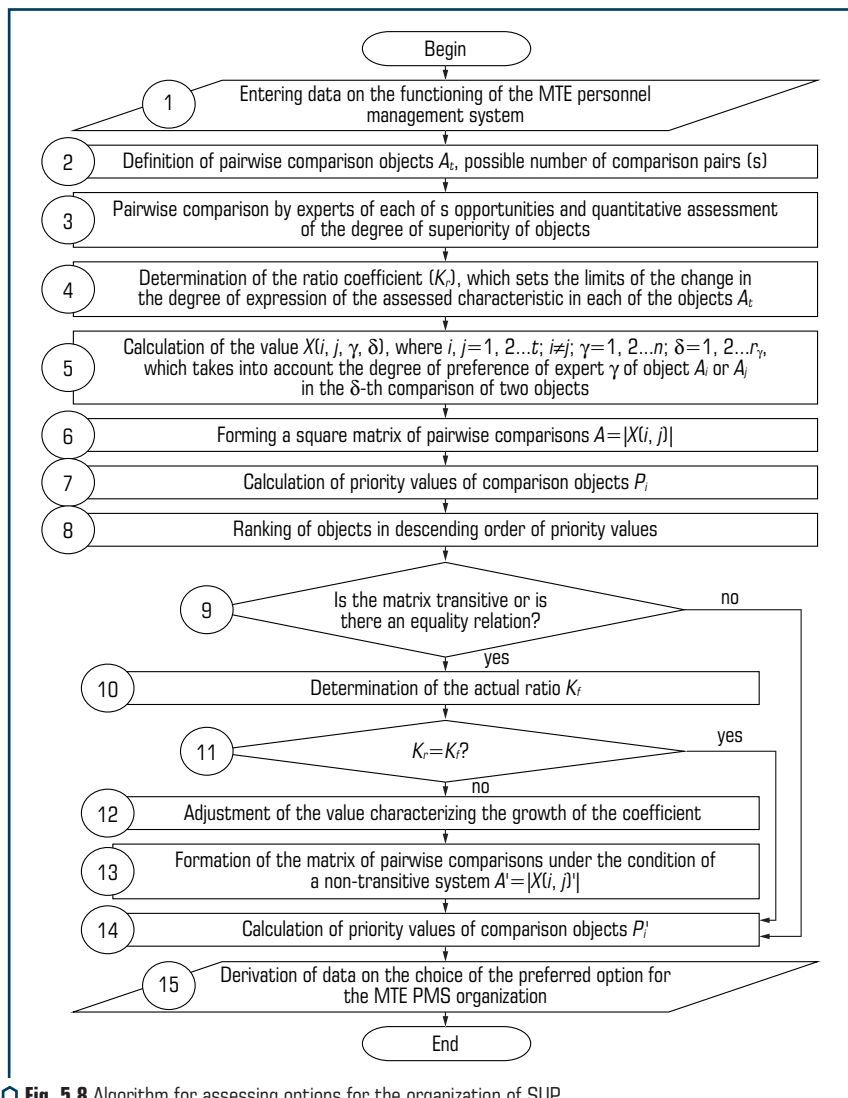
$$\rho_{s(k)} = \sum_{s(k)} \rho_{s(k)}^{rel(2)} \alpha_{s(k)},$$

where  $\rho_{s(k)}^{rel(2)}$  – the normalized iterated force of the second order according to  $s(k)$  variant of the PMS organization;  $\alpha_{s(k)}$  – the significance of the criteria for the comparison of options according to  $s(k)$  option of organization of MTE PMS.

The results of the comparison of options for the organization of the personnel management system according to the criteria: the effectiveness of the organizational structure, the completeness of the implemented personnel management functions, social standards and the possibility of implementation in MTE are presented in **Table 5.2**.



Comparison of criteria among themselves takes place according to the same algorithm with the aim of obtaining their specific significance. On the basis of the obtained results, let's determine the complex priorities of the options for the PMS organization (**Table 5.3**).



**Fig. 5.8** Algorithm for assessing options for the organization of SUP  
Source: author's development

● **Table 5.2** Matrix of comparisons of options for the organization of MTE PMS according to the criterion – effectiveness of the organizational structure

Variant of PMS organization	V-1	V-2	V-3	And the generated force is of the first order $\rho^{rel(1)}$	Relative priority of the first order $b_{gs}\rho^{rel(1)}$	Normalized and applied force of the second order $\rho^{rel(2)}$	Relative priority of the second order $\rho_s$
The criterion is the effectiveness of the organizational structure							
I. V-1	1.0	0.5	0.5	2.0	0.22	5.5	0.22
V-2	1.5	1.0	0.5	3.0	0.33	8.0	0.32
V-3	1.5	1.5	1.0	4.0	0.44	11.5	0.46
II. Sum				9	1.00	25.0	1.00
The criterion is the realization of our functions and personnel management							
III. V-1	1.0	0.5	0.5	2.0	0.22	5.5	0.22
V-2	1.5	1.0	0.5	3.0	0.33	8.0	0.32
V-3	1.5	1.5	1.0	4.0	0.44	11.5	0.46
IV. Sum				9	1.00	25.0	1.00
The criterion is social and social and standard							
V. V-1	1.0	1.5	0.5	3.0	0.33	8.0	0.32
V-2	0.5	1.0	0.5	2.0	0.22	5.5	0.22
V-3	1.5	1.5	1.0	4.0	0.44	11.5	0.46
VI. Sum				9.0	1.00	25.0	1.00
The criterion is the possibility of implementation							
VII. V-1	1.0	1.5	1.5	4.0	0.44	11.5	0.46
V-2	0.5	1.0	0.5	2.0	0.22	5.5	0.22
V-3	0.5	1.5	1.0	3.0	0.33	8.0	0.32
VIII. Sum				9.0	1.00	25.0	1.00

● **Table 5.3** Determination of comprehensive priorities according to the MTE PMS organization options

Criteria for choosing options for the PMS organization	Specific significance of selection criteria	IX. Variant of PMS organization			Complex priority according to the options for the PMS organization		
		V-1	X. V-2	V-3	XI. V-1	A. V-2	V-3
XII. C-1	0.22	0.22	0.32	0.46	0.048	0.070	0.101
C-2	0.22	0.22	0.32	0.46	0.048	0.070	0.101
C-3	0.22	0.32	0.22	0.46	0.070	0.048	0.101
C-4	0.35	0.46	0.22	0.32	0.161	0.077	0.112
Sum	1.00	—	—	—	0.328	0.266	0.416

Based on the obtained results, the third option of the organizational structure of the personnel management system, which involves the formation of a strategic personnel management section, the directions of which will be the coordination and implementation of personnel management functions in a strategic aspect, is the most expedient according to the greatest value of the complex priority.

### **5.3 DISCUSSION OF THE RESULTS OF THE FORMATION OF THE MTE PERSONNEL MANAGEMENT SYSTEM BASED ON A HOLISTIC APPROACH**

Ensuring the competitiveness and stability of the organization depends on the implementation of effective strategies related, first of all, to the implementation of socially responsible business. This requires constant maintenance of the balance between the economic and social efficiency of the enterprise. This is of particular importance for MTE, which is gradually trying to ensure a decent level of wages for hired labor, social packages, etc. In these conditions, the most important element is the personnel.

It is necessary to form a holistic approach to personnel management, which will ensure the ability of the organization to achieve its goals through the best use of available resources, the MTE adaptability to the external environment, and the implementation of sustainability principles.

The application of a holistic approach to personnel management will allow to agree and effectively coordinate the implementation of organizational strategies, tasks of process-oriented management and logistics management of MTE.

A personnel management system was formed based on a holistic approach as a set of three subsystems: management of incoming, internal and outgoing personnel flows. The main differences of this system are: personnel flows are considered from the enterprise as a supplier of work to the consumer (potential or existing personnel or personnel being dismissed); implementation of all main management functions (planning, organization, development, motivation and personnel control) is provided for; the element "information, organizational and psychological support" is included in the components of the system.

It is taken into account that the optimization of personnel flows is based on a certain set of initial provisions: the personnel system is considered as a complex system that has a number of subsystems; each subsystem has its own criterion of optimality, which reflects its internal (immanent) interests; the functioning of the structure is a process of interaction of these subsystems.

However, for the organization to achieve its goals, control is one of the main functions of management in general and personnel in particular.

Since this function is not disclosed in this chapter of the monograph, the next chapter 6 will be devoted to the solution of this vector.

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