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ECONOMIC - MATHEMATICAL MODELS OF MANAGEMENT OF LABOR RESOURCES OF THE ENTERPRISE

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In the conditions of economic crisis the questions of practical application of modern forms of management of labor resources that will allow to increase social and economic efficiency of any enterprise acquire special value. The success of the organization is ensured by the employees who work in it. Therefore, the modern concept of management of the organization (enterprise) from a large number of functional areas distinguishes the management of personnel policy. The basis for personnel management are the laws and patterns studied by various sciences related to management (economic cybernetics, management theory, management, etc.). However, the management of labor resources of the enterprise is subject to the laws inherent only in this process.

The problem of determining the effectiveness of enterprise management and finding ways to improve it is difficult, because the company is an open system and operates within the influence of many factors. Some factors pose a threat to the existence of the enterprise, others, on the contrary, provide new opportunities, the use of which allows to increase the efficiency of management (the latter can interact with each other).

Factor analysis of the impact on the efficiency of enterprise management should be investigated from two positions:

- the influence of the external environment (micro- (immediate environment) and macroenvironment) of the enterprise;
- the internal environment of the enterprise (organization).

The macroenvironment may include factors that do not have a rapid and direct impact on the efficiency of the enterprise. However, they can have an indirect effect.

The factors of the macroenvironment include military conflicts, economic crises, political processes in the country, legal regulation, the state of the economy in general, the level of scientific and technical (technological) processes, the state of the environment and more.

Figure 1 shows the most common methods of collecting information to track the state of the environment.

SWOT - analysis (strength - strength, weakness - weakness, opportunities - opportunities, threats - threats) is one of the methods of analysis of the environment, which involves identifying strengths and weaknesses, threats, opportunities, later establishing chains of links between them and use in further the latter in order to form the strategy of the organization.

Methods of forming information support:
- research offices, which are carried out through the search for secondary information on various types of media (analysis of periodicals, books, media, information from Internet sites, etc.);
- participation in various conferences;
- analysis of the experience of employees of organizations;
- market research

Fig.1. **Methods of collecting information to track the state of the environment**

Factors of the external environment interact with each other, create a system of influence on the effectiveness of management of the enterprise (organization). The level of adaptation to the variability of the environment will determine the level of management efficiency. You can form a mathematical expression of the influence in the dynamics of macro-environmental factors:

$$F_1(t) = \{f_1(t), f_2(t), f_3(t) \dots f_n(t)\} \quad (1)$$

where: F_1 - is the total set of influences of macro-environmental factors on the effectiveness of management of the organization; $f_1 f_2 f_3 f_n$ - a subset of the influence of scientific and technological, environmental, geographical, economic, state, social factors.

Factors influencing the external microenvironment include the peculiarities of the functioning of economic relations with suppliers (for raw materials, primary energy resources, equipment components, etc.) to service consumers. Taking into account the elements of influence of the microenvironment creates the conditions for the formation of a range of knowledge about products or services needed by the consumer, their volume, quality and cost, and this, in turn, promotes timely management decisions and increases overall efficiency.

The influence of microenvironmental factors can be determined in the dynamics by the following mathematical dependence:

$$F_2(t) = \{f_1(t), f_2(t) \dots f_n(t)\} \quad (2)$$

where: F_2 - is the total set of influence of microenvironmental factors on the efficiency of enterprise management; $f_1 f_2 f_n$ - a subset of the influence of factors in the areas of suppliers and consumers.

If we take into account the influence of the external environment when assessing the effectiveness of management, it will help to track external factors in order to identify and prevent potential security of timely use of enterprise capabilities, predict precautionary measures in crisis situations, develop a strategy. All these measures will increase the effectiveness of the latter.

The influence of environmental factors on the effectiveness of enterprise management in the dynamics can be represented as the following mathematical expression:

$$E_z = \{F_1(t), F_2(t)\} \quad (3)$$

where: E_z - the effectiveness of enterprise management under the influence of external factors; $F_1(t)$ is a subset of macro-level influencing factors; $F_2(t)$ is a subset of microlevel factors.

It should be noted that the analysis of the external environment alone does not give a complete picture of the effectiveness of enterprise management, as the use of internal reserves and resources significantly affects the overall performance of the enterprise. The source of accumulation of all reserves of the enterprise: financial, resource, personnel, technical, innovative is the internal environment, which is used as a means of effective response to the external environment.

The factors of the microenvironment include those that directly affect the activities of the enterprise, in particular: consumers, suppliers, competitors, the labor market, government agencies, laws governing the activities of the latter.

The internal environment makes it possible to identify the company's capabilities to achieve its goal. The internal environment includes the following areas: (Fig. 2).

Components of the internal environment
- personnel and their classification, potential, preferences;
- organization of management and marketing;
- the state of the main activity (production, organizational characteristics, research, development, etc.);
- financial position;
- organizational culture

Fig. 2. Directions of the internal environment of the organization

As for the internal environment, his research aims to identify "weaknesses" and "strengths" of the organization. Of course, strengths are a support for the company in the competition, and weaknesses need to be analyzed and try to get rid of them. The external environment also needs to be studied, as it can have both positive and negative effects on performance.

The mathematical influence of internal environmental factors on the efficiency of enterprise management can be represented as follows:

$$E_y = \{F_2(f_1(t), f_2(t), \dots, f_n(t))\} \quad (4)$$

where: E_y - the effectiveness of enterprise management under the influence of external factors; E_z - a subset of the influence of internal factors on the efficiency of enterprise management; f_1, f_2, \dots, f_n - a subset of the influence of factors in the areas: production, economic, organizational - structural, innovative, environmental.

Then, the dependence of the effectiveness of enterprise management on the influence of the above factors acquires the following mathematical expression:

$$E = \{E_2, E_y\} \quad (5)$$

$$E = \{F_1, F_2, F_3\}$$

where: $F_1(t)$ is a subset of macro-level influencing factors; $F_2(t)$ - a subset of microlevel factors; $F_3(t)$ is a subset of internal influence factors.

Conclusion. Analysis of the external and internal environment can be considered a mandatory element of the strategic analysis of enterprise development. Expert evaluation provides an opportunity to generate effective data that will help in making management decisions.

SWOT - analysis provides an opportunity to establish links between the strengths and weaknesses of the enterprise, to assess threats and opportunities. It gives an idea of the capabilities of the enterprise and emphasizes the need to combine these internal capabilities with the external environment. Thus, the combination of negative and positive factors (strategic balance) allows you to properly assess their capabilities and forecast their activities.

SWOT analysis is a completely universal analytical tool that allows you to choose a development strategy, although to some extent it is subjective.

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ENSURING SOCIO-ECONOMIC EFFICIENCY OF RETAIL IN THE CONDITIONS OF CRISIS ON THE BASIS OF THE DARK STORE FORMAT

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Over the last few months, there were some drastic changes in the retail activities all around the world: implementation of strict quarantine because of the COVID-19 pandemic, changing the traditional format of retail networks work, prohibition of visiting shopping and entertainment centers, restriction of trade floors number of visitors. This has significantly declined the socio-economic efficiency of the trade establishments; furthermore, many of them are on the verge of closing because of the dramatic income decline and outflow of customers. At the same time, the reduction of maintenance, staff and logistics costs may cause the closure of stores (up to 30 % of their total number according to the calculations by the international consulting company Colliers International).

At the same time, online trade significantly intensified: in the first quarter of 2020, online sales in France increased by 87 %, in the US and UK – by 53 %, in Spain – 62 %, in Korea, Australia, China – by 45 %, compared to the same period in 2019; the number of online sellers in Spain increased by 30 %, in France – by 13 %, and in Italy – by 85 % [1]. During the first 2 months of quarantine, Ukrainian IT company EVO (representing such marketplaces as Prom.ua, Bigl.ua, Shafa.ua, Crafta.ua, Kabanchik.ua) increased its sales of goods by 20 %, and the demand for electronic document management services Vchasno.ua has increased 3 times.

One way out of this difficult situation for retailers may be to change the format of trade, which will allow the redirection of resources to provide online trading as long as the retail space and inventories are still functioning. This is the format of Dark Store in retail trade.

Dark Store serves only purchases generated via the Internet in the distribution center format. It is completely closed for customers, but its interior may look like a regular supermarket. The customer places an order through any active remote communication channel (online store, call center, chatbot, mobile application) and pays for it; then packers team is in charge of selecting the right goods scanning their codes using special terminals (fig. 1). The scanned and selected goods are
