DEVELOPMENT OF INDUSTRIAL ENTERPRISE: METHODOICAL APPROACH

A methodical approach to planning a resource loop for quality management of industrial enterprises based on an integrated system for planning a resource loop for the quality development of an enterprise with feedback is proposed, by creating an algorithm for the implementation of demand planning programs, by linking the levels of resource planning for the current production activity of the enterprise and the implementation process quality development management, according to the model of qualitative development enterprises in the integrated ERP planning system, with indicators of the effectiveness of resource planning, which makes it possible to effectively ensure the resources of the quality of the enterprise’s development.

Introduction. The leading industries of Ukraine have unsatisfactory development indicators for today. Over the past year, there has been a rapid decline in exports, industrial production has declined, and the number of unprofitable enterprises has increased. The connecting link between all branches of industry is engineering. It is also one of the budget-forming sectors of the Ukrainian economy. In the structure of the industry, heavy engineering occupies the largest share, including specializing in the production of equipment for the mining and metallurgical industry, power blocks, handling equipment, and so on.

The current difficult state of the industry of Ukraine and the machine-building industry in particular is the result of the absence of structural reforms that would allow us to count on positive results in the future. In addition, the development of industrial enterprises has always had shortcomings in system management, in particular, there are no adequate tools to assess the effectiveness of enterprises in comparison with the external environment, to show their potential and to develop effective solutions for the quality of development of all areas of the enterprise. Today, Ukrainian industrial enterprises function mainly in the mode of supporting current reproduction and do not pay enough attention to their innovative development and measures of extended reproduction. In connection with this urgent problem today is the development of effective scientific and methodological approaches to quality management of industrial enterprises in general and machine-building enterprises in particular.

Method and objects of research. The theoretical and methodological basis of the research is the work of domestic and foreign scientists in the field of industrial development management and quality management. The information base of the research is the data of the State Statistics Committee of Ukraine, financial and economic reports of industrial enterprises.

Results and its discussion. The purpose of this article is to develop an approach to planning a resource loop for the quality of industrial enterprise development.

The analysis of problems of resource support for quality management of industrial enterprise development showed that by their nature they can be both private and com-
mon at all levels of enterprise management. This circumstance is due to the existence of such factors:

1. The existence of a low level of consumer demand in domestic innovative products due to the richness of the market with imported goods.

2. The unresolved problem of increasing the level of competence of personnel, the loss of human resources, the underdevelopment of the training system and the transfer of experience in the development and implementation of innovations.

3. The investment mechanisms of enterprises are often not sufficiently developed due to the high riskiness of development projects, on the one hand, and the comparatively large volume of investment required for the creation of research samples of products, on the other.

4. The general, unfavorable market background formed by the global economic crisis, connected with the uncertainty of market prospects, leads to low motivation of researchers traditionally aimed at generating innovations [1-3; 7].

Turning to the problem of increasing the efficiency of investment and innovation activities of industrial enterprises, we can state that a significant deterrent to its development is the fact that quality management programs of the enterprise tend to conflict with economic development programs (in the form of using unified resource sources). As a result of the search for ways to solve the problems of resource support for the qualitative development of industrial enterprises, a corresponding scheme was developed.

The above sequence of actions regarding the planning of the resource loop for the quality management of the enterprise involves the inclusion of a sufficient level of expenditures for ensuring quality development with the possibility of their rapid redistribution [6; 9].

On the basis of the analysis, a model for the qualitative development of the enterprise was developed in the implementation of the planning programs for its needs.

The model provides for: determining a sufficient level of resource provision using the developed criteria for the effectiveness of the resource loop of a quality development of the enterprise, on the one hand, and minimizing the level of resource support for the current production activity of the enterprise, on the other.

Thus, the developed model of enterprise development quality management in the development of the project for planning the costs of resource support makes it possible to take into account the need for temporary, investment, material, personnel, production, information and other resources in terms of maintaining the desired proportions between the current production activities of the enterprise and the implementation process measures of qualitative development.

The identification of a set of factors that affect the planning of a resource loop for qualitative development based on enterprise needs planning programs can be carried out taking into account:

- dynamics of cyclical development of enterprises, including the laws of their functioning and development, the stages of the life cycle of products;

- risk factors for enterprise development projects, including risk assessments using probabilistic models;
- a general analysis of the financial condition of the enterprise, including an analysis of changes in the composition and structure of assets of the enterprise's balance sheet, the structure of liabilities of the enterprise's balance sheet, liquidity;
- analysis of the organizational and technical level of the enterprise;
- analysis of the volume of production and sales of innovative products, in particular the volume and structure of output, as well as reserves of growth in output;
- analysis of investment support for quality development, in particular, efficiency in the use of circulating and irreversible economic assets;
- analysis of the material provision of quality development, in particular the quality of the resources used;
- analysis of the provision of labor resources, labor productivity;
- analysis of the provision of information resources;
- analysis of the use of intellectual resources;
- analysis of the cost price of innovative products, including functional and cost analysis in the modernization of products [4, 5].

The system of criteria for the effectiveness of planning a resource loop for the quality management of an enterprise when designing a resource cost planning project is described by relative indicators $M_{RP}$ that have an upper and lower tolerance limit.

In the region close to the optimal value, the increase and decrease in the level of spending on resource support $L_{RP}$ causes a slight decrease in the value of the indicator under study. With a further decrease or increase in the level of spending on the resource, the value of the estimate $L_{RP}$ tends to decrease, but if the value is less ($L_{RP} < L_{RP_{min}}$) than or greater than the maximum permissible upper limit ($L_{RP} > L_{RP_{max}}$), the estimate is zero ($M_{RP} = 0$).

Thus, the relationship between the absolute value and the estimate of the level of spending on the resource provision can be determined using the system of indicators.

From $L_{RP_{min}} \leq L_{RP_{opt}}$:

$$M_{RP} = \frac{1 - \left(\beta \times \frac{L_{RP_{min}}}{L_{RP_{opt}}}\right)^{a}}{1 - \left(\beta \times \frac{L_{RP_{min}}}{L_{RP_{opt}}}\right)^{a}}$$ (1)

From $L_{RP_{opt}} \leq L_{RP_{max}}$:

$$M_{RP} = \frac{\left(\beta \times \frac{L_{RP_{opt}}}{L_{RP_{max}}}\right)^{a}}{1 - \left(\beta \times \frac{L_{RP_{opt}}}{L_{RP_{max}}}\right)^{a}}$$ (2)

where $\beta$ — is the coefficient that determines the value of the estimate, if $L_{RP} = L_{RP_{min}}, (\beta < 1)$;
\( a \) — a coefficient that characterizes the rate of change in the value \( M_{RP} \) of the assessment, depending on the change in the level of spending on the resource provision \( L_{RP} (a > 1) \).

The level of expenditures for resource provision \( L_{RP} \) is determined by the parameters of the available resources of the enterprise:

\[
L_{RP} = \sum_i L_{RP_i} \times \chi_i
\]

(3)

where \( L_{RP_i} \) — indicators of resource support for each \( i \) - th component: the production process, logistics;

\( \chi_i \) — the weight of that composite expenditure on resource support \( \sum_i \chi_i = 1 \).

The importance of spending levels for resource provision \( L_{RP_{min}}, L_{RP_{opt}} \) and \( L_{RP_{max}} \) is determined by the parameters of the company's qualitative development, starting from the portfolio of technological projects and ending with the influence of selected measures in case of their success on the enterprise's economy.

When forming the optimization algorithm for the resource management loop of enterprise development quality, the level of resource support for the traditional (current) activity of the enterprise and the process for implementing measures to manage the quality of the enterprise's development were coordinated during the development of the project for planning resource costs [8].

The developed algorithm for optimizing the resource loop for quality management of the enterprise during the development of a project for planning the costs of resource provision.

Thus, during the formation of the resource loop for quality management of the enterprise during the development of the project for planning the costs of resource support, we linked the levels of resource planning for the current production activities of the enterprise and the process of implementing measures for managing the quality of development, according to the model of qualitative development of the enterprise in ERP, with certain indicators of the effectiveness of resource planning and distribution.

The proposed algorithm for optimization of the resource loop of quality management of enterprise development in the development of the project for planning the cost of resource support provides for:

1. Determination based on the selected parameters of resource planning and the characteristics of the qualitative development of the enterprise, the compliance of the levels of resource support in the areas of the implementation of measures for the qualitative development of the enterprise and its current production activities to the proposed requirements.

2. Effective redistribution of financial and material resources in accordance with requirements in the course of quality management, and in case of need - attracting additional investment resources.
3. The cyclic process of optimization of the resource loop of quality management of enterprise development when implementing the project of expenditure planning, which is accompanied by the saving of resources with their further rational redistribution between the current production activities of the enterprise and measures for managing the quality of development.