The National Economic Strategy, proposing the development of Ukrainian industry based on the concept of "Industry 4.0" (direction 10), states that "there is a break in production chains and the loss of part of the sales markets, which leads to a drop in production volumes" and sets one of the tasks of increasing the efficiency of industrial enterprises on the basis of: "incentives for enterprises to take measures to systematically improve work efficiency; promoting the creation of the most complete production cycle; revision of existing permitting procedures in the field of industry" [1].

The functioning of production and sales systems as a component of the economic potential of the enterprise forces the search for new, more effective measures of production management and its logistical support.

The stable position of the enterprise in a competitive environment is determined by its economic potential, which forms the basis for ensuring the level of efficiency for this period and in the future. The degree of use of potential depends on the overall strategy of the enterprise, the main principle of which is: to produce competitive products and strengthen its competitive position in commodity markets [2]. Achieving high competitive position in the market, providing cost-effective and efficient operation of the enterprise is impossible without implementing quality management organizational decisions. It depends on the level of economic potential of the company and the size of its reserves [3].

Works [4,5] emphasize that in the conditions of fluctuations in the market environment of any company, it is necessary that the economic strategy does not lag behind the changes in the market, and therefore a methodology of systematic planning and design of the logistics system is needed, which allows taking into account the circumstances that arise, and evaluate alternatives for the future development of events.

If the enterprise is considered as a production and sales system, then it is possible to distinguish three fundamental functional subsystems – material and technical support, production and sales. Logistics-oriented design of such a system includes the optimal organization and effective management of the movement of material flows, which helps to solve the tasks of system analysis and synthesis within the limits of this approach, taking into account the requirements of a comprehensive approach to the organization of the movement of flows, as well as its consideration from the sources of their origin to the final points of consumption.
The basis of initial data for the design of economic systems is most often the requirements for flows at the output of the system, that is, flows that are actually produced by it. This is due to the objective laws of the market economy, which fix the primacy of needs and, accordingly, demand in relation to production and in accordance with the supply of certain goods and services. After all, it is the demand that determines the composition, power and other characteristics of the output flows. Thus, the requirements imposed on the outgoing flows determine the requirements on the system's input flows.

From the point of view of modern logistics science, any enterprise in the field of material production can be considered as one production and sales system (PSS), which has three important functional subsystems: supply (material and technical support), production and sales. During the design of the system, it is necessary first of all to carry out the formation of a methodological foundation in order to ensure, as a result, a high system-wide efficiency of its functioning.

The consolidated structure of PSS flows is shown in Fig. 1, where procurement flows ($F_{Pr}$) enter the subsystem by means of transport network traffic material and technical support (MTS) PSS. In the subsystem MTS the nature of the movement of incoming flows changes, and they turn into production support flows ($F_{PS}$), vertical lines on the flow arrow reflect the presence of an accumulation phase in their movement.

**Fig. 1. The generalized structure of flows in the production and sales system of an industrial enterprise (the author's idea)**

Flows of production support fall into the production subsystem, enabling the emergence of production flows ($F_P$). Here, the vertical lines carry a similar semantic load, with the difference that in the production subsystem, accumulation in the general case occurs repeatedly from the flow of individual stages of production and is implemented in the form of inter-shop divisions. Flows from the production subsystem enter the sales subsystem, where accumulation also occurs, forming sales support flows ($F_{SS}$), and after certain preparation, they turn into sales streams ($F_S$) which, again with the help of the movement of the transport network, get to their intermediate or final consumer.

The process of logistics-oriented design of the production and sales system can be divided into several key stages.
At the first stage, in accordance with the requirements for the flows at the output of the system, determined by the market situation and dynamics, the basic requirements for the structure and composition of the flows at the input of the system are formed, as well as the system of general goals and criteria for the functioning of the system is developed.

At the second stage, according to the subject area, the system is designed based on the analysis of movement and transformation in the flow system. Formalization and attribution of all flows and operators of their transformations are carried out, which allows to obtain a fully formalized representation of the system and build a complex model of its functioning.

At the third stage, a formalized model of the system is built and a system of restrictions is formed for the values of parameters of flows and operators. Based on them, the impact of changes in individual parameters on the final results of the system functioning in general is assessed by modeling scenarios of the development of the situation in the external environment. The search for such values of these parameters is carried out, which will allow to achieve optimal values in accordance with the criteria formulated at the first stage, and ensure a given level of stability and profitability from the system's activity.

The last stage implements the feedback function, allowing the developer to assess the feasibility of building the system taking into account the developed project. Individual processes and transformations that reduce inverse efficiency should be reviewed, and the corresponding elements of the system should be redesigned. Thus, this stage involves making adjustments to the project and the built model to achieve higher values of the resulting indicators.

Conclusions. The ultimate goal of logistics-oriented design is to obtain a fully formalized representation of the production and distribution system as part of the logic of flows and operators of their transformations, which allows monitoring the impact of changes in any factor on the overall system efficiency of economic activity and the level of economic potential. In a generalized form, the production and sales system can be presented as follows: ensuring the necessary profitability of the system's activity, ensuring the organizational and economic stability of the system, optimizing the level of service for system consumers.

References:


