

Perspectives of JIT system application at machine building enterprises

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Abstract. The article describes the features of the Japanese system of management and organization of production JIT, shows its structural elements, analyzes the key conditions of use, identifies the main advantages of the JIT system. The features of the system of cost accounting and calculation within the framework of JIT are established, the factors hindering the use of the JIT system at Russian enterprises are determined.

1 Introduction

In modern conditions of increasing competition and integration activity, the main function of manufacturers of engineering products is to manufacture competitive products (services) at the optimal level of costs for their production. In this regard, the priority task of the financial and economic unit of an industrial enterprise is to find ways to reduce the cost of production

2 Materials and methods

In the world practice of enterprise management, considerable experience has been gained in the application of effective methods of organizing production processes, which make it possible to achieve this goal in reality. In particular, the Japanese system of organization of production JIT (just-in-time) is one of the most advanced and promising for use at Russian enterprises of mechanical engineering.

The structure of the JIT system is presented in Figure 1.

The main feature of the JIT system is to ensure the rational use of the production potential of an enterprise by eliminating all irrational expenditure of resources. All business processes of an enterprise (logistics, production, sales, etc.) should be organized in such a way as to minimize the non-productive outlays, eliminate operations and processes that do not create added value. This can be achieved under the key conditions:

organization of business processes on the principle of approximation of total costs to the value of production costs;

the introduction of a system of continuous quality control;

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the construction of material flows according to the “pull” principle (based on the consumer demand orientation) [1].

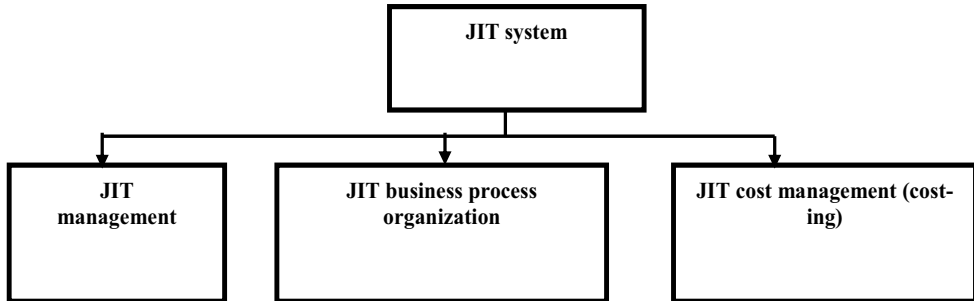


Fig. 1. Elements of the JIT system.

The basis of the organization of business processes is continuous-flow object production on the principle of manufacturing products only if there is a demand for it and in the quantity demanded by the consumer. In this case, it is not just end users. Each subsequent operation is a continuation of the previous one; therefore, only what is requested by the “consumers” in the next operation is performed at it. The start of the production process begins only after a signal about the availability of an order at the subsequent operation. Material resources are delivered to the workshop directly by the beginning of the production process in small batches. The process of supplying production shops and sites is continuous and, in fact, practically piece by piece.

The efficiency of management and organization of JIT business processes, according to experts, is as follows [2]:

1. Minimization of stocks of material resources provides a reduction in capital investments in the creation of warehouse space and the current costs of their maintenance (the principle of "zero stocks").

2. No risk of obsolescence of stocks, as the remnants of work in progress and finished products, in fact, minimized.

3. Balancing the bandwidth of workplaces, which leads to a uniform loading of the performers.

4. The reduction in the duration of the production cycle enables it to be quickly brought to the market and allows the enterprise to respond more quickly to market changes.

5. Significant improvement in the quality of production and products, as with a small batch of manufactured products (in some cases a series is one unit of production), the sources of problems are easily identified and corrected.

6. The sharp reduction in losses from rejects (often –no rejects at all), the absence of equipment breakdowns and downtime of workers.

7. Improving the reliability of the execution of orders, since the system of their planning is focused not on months, but on days

8. 100 % timeliness of delivery

3 Results

The effective management system and organization of business processes JIT entails the use of an effective system of accounting for the cost of production and sales of products. In the JIT system, cost accounting has been transformed into a cost management system, the basic principle of which is the need to regulate the level of costs, regardless of the degree of

their influence on financial indicators or inventories. The JIT cost management system greatly simplifies the process of cost accounting and helps managers control costs. As a result, this system contributes to the formation of the optimal level of production costs, improving the quality of production and service, making effective decisions about the nomenclature and range of products, its price, and methods of selling [4].

If we talk specifically about JIT-calculation, this system is a modification of the serial method of cost accounting for production and calculation of production costs, which is based on the principle of eliminating redundant information for management and as a result - a significant reduction in the workflow system.

Experts identify the following features of the calculation of costs in the JIT system [3]:

1) The cost of inventory and other direct costs of production is calculated on a single consolidated account. This is due to the fact that minimizing the cost of internal plant

2) Costs for labor are not direct costs but are part of general production overheads.

3) Part of indirect costs traditional for the domestic system of accounting is transformed into direct ones, which helps simplify the procedure for distributing manifold costs between types of products (repair and maintenance costs, depreciation of process equipment, quality control, etc.).

4) Labor costs and production overheads are charged directly to the cost of goods sold, bypassing production accounts.

5) The accuracy of calculating the unit cost is increased.

Priorities on the analysis of deviations in wage costs and overhead costs are changing. The analysis of deviations is carried out in order to predict the likely trends in the development of production (but not to identify the causes in each particular case).

4 Discussions

For the JIT cost management system, performance indicators are not typical, unlike they are for the traditional Russian accounting system. For example, indicators such as production, labor intensity, equipment utilization, etc. cannot be used in the JIT system, since they contribute to an increase in inventory values without taking into account the real demand for products. These indicators are focused on increasing the volume of production, while the volume of products sold and their quality should be priorities [5].

The experience of using the JIT system at industrial enterprises in Japan and the USA (Toyota, Motor Sales, Round Rock, Dell Computer, CiscoSystems0) indicates a significant reduction in costs, improving the quality of products, increasing competitiveness and production efficiency in general. However, the significant difficulties associated with the implementation of this system in the practice of business enterprises do not lead to widespread of the JIT in the world. Among the main problems, experts point out:

significant investments in changing the management and organization of production;

high risks of stopping business processes in the event of force majeure;

dependence of business processes on high quality and delivery time of inventory items;

the need to link the JIT system to manifold partner information systems;

the presence of highly qualified and competent managers at all levels of the enterprise management system (including top management);

compulsory application of the principles of participatory management, etc.

5 Conclusions

Nevertheless, increasing competition between producers, increasing requirements for the quality of products from consumers, the increased cost of fuel and energy resources

required for production do not leave the possibility of long-term stable existence of domestic enterprises on the market. In the coming years, under the influence of scientific and technological progress and trends in the digitalization of the economy, it will be necessary to change both the management systems and the organization of production of Russian producers, and the cost accounting system. And in this regard, in our opinion, using the JIT system in the practice of economic activities of Russian enterprises open up broad prospects.

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