Working capital as a multi-format process for enterprise management in modern production

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Abstract. This article discusses the methodology of working capital management in a company in a competitive environment. Furthermore, it studies the introduction of advanced Information technologies (IT) that identify hidden resources and potentials, regulate and optimize production processes to improve operational production management.

1. Introduction

In modern industrial production, the problem of working capital management at Russian enterprises is quite acute. In industrial enterprises, this problem is especially relevant due to the specifics of industries. The relevance of the problem is caused not only by the huge volumes of material resources, but also by the variety of inventory items that differ both in appearance and in the nature of their consumption and purpose.

In the course of market reforms, large domestic industrial enterprises, through the separation of auxiliary industries into subsidiaries, as well as horizontal and vertical integration with other enterprises, were transformed into holdings, which are a set of economic entities connected by a single technological process, but at the same time endowed with a certain independence. If in a single enterprise the problem of optimizing the inventory level of individual units was solved within the framework of the general task of managing the production working capital of the enterprise as a whole, then in the conditions of a purchasing organization with centralized warehouses it did not require taking into account external factors of their formation and was not connected with the management of working capital of the enterprise in general, with the legislative separation of auxiliary branches (servicing farms), industrial enterprises got capital and access to various sources of supply at their disposal, the question arose of managing methods not only of the physical level of stocks in these units, but also of current assets, of which they are an element.

At the same time, the existing methods for optimizing the management of working capital described in the literature are aimed at independent business entities and involve the free variation of the parameters of their formation. Therefore, to build management systems for production working capital in auxiliary production units of industrial holdings, it is necessary to develop methods based on the principles of balance and efficiency, taking into account the current conditions of their functioning, the technologically and economically dependent position within the holding, as well as the technological features of production.
2. Theoretical part

Worldwide, more than one hundred textbooks, manuals, teaching aids and working capital management manuals have been published. It is worth noting the publications of such foreign authors as R.J. Carter, M. Christopher, J. Cooper, J.L. Gattona [1, 2, 3] et al.

Of particular interest is the book by Donald J. Bowersox and David J. Kloss, “Logistics: integrated supply chain” [4], which defines the place and role of working capital management in logistics. The working capital management is defined by the authors as a complex process that ensures compatibility of operations with working capital within and outside the company throughout the value chain in which it is included. Three approaches to working capital management are considered: reactive (otherwise referred to as “pulling”, which means that consumer demand literally pulls the corresponding product through the sales channel from the producer to the final consumer), planned (involves promoting the product and distribution within the sales channel for a certain schedule in accordance with the forecast of product demand and its availability in the market) and combined (combines the first two and manifests itself in such management strategies, which attributed to changes in market conditions and commodity positions).

Donald J. Bowersox and David J. Kloss focus on working capital management policies and strategies. Working capital management policy consists of decisions about what to buy or produce, when and in what amounts. It also includes a decision to place stocks in production facilities and distribution centers. The second element of the working capital management policy is strategy. You can manage the working capital of each distribution warehouse separately, or you can manage the working capital in different warehouses centrally. Centralized management requires greater coordination and information support.

Increasingly in recent years, the problem of working capital management has become the subject of dissertation research.

The analysis of both dissertation research and other economic publications on the problem of working capital management requires the determination of the goals and objectives of it.

To determine the goal of working capital management, the following is considered: industrial enterprises, in particular in the metallurgical industry, suffer financial losses, both with a minimum level of reserves and with the redundancy. It is the optimization of stock levels that is the main goal of managing them. At the same time, there are reasons for creating stocks in organizations, as well as factors that help minimize their level.

R.V. Nemtinov defines the prevention of production shutdown with insufficient supply as the reason for creating reserves [5]. He identifies the following factors leading to the need for reserves: discreteness of supply; random fluctuations in demand, supply, duration of intervals between deliveries; expected changes in the market situation. At the same time, R.V. Nemtinov notes the reasons that make it necessary to minimize stocks: payment for the physical storage of stocks; lost profits from funds invested in shares of enterprises; possible losses in the quantity and quality of stocks during storage; obsolescence of stocks.

Summarizing the foregoing, it can be noted that in order to study methodological approaches to working capital management, first of all, the history of the development of the theory of working capital management was analyzed and the researchers involved in this branch of knowledge were named. In addition, some dissertational studies that were close to the topic of the study were indicated. Next, the goals and objectives of working capital management were formulated, and their wording was considered in the framework of logistic, regulatory approaches, as well as from the perspective of financial management. In addition, signs of the classification of problems in the theory of working capital management and the procedure for developing an algorithm for managing working capital are given. Of the many working capital management systems described in modern economic science, the study considers those that are of interest in the context of the problem of managing production working capital at auxiliary production facilities of metallurgical holdings. Logistic systems for working capital management with a fixed order size, with a fixed time interval between orders, with a given frequency of replenishment to a constant level of "minimum-maximum", as well as a number of authoring systems
are analyzed. All systems were analyzed for their advantages and disadvantages, as well as applicability in the industry under study. Research indicates the need for selective governance.

3. Methodology

The new technological structure, based on the principles of the post-industrial economic model, sets the task for enterprises, complexes and industries to change their targets. In the new economy, many of the fundamental principles and laws that emerged in the industrial era do not work. For example, the competitiveness and prosperity of enterprises at the present stage depends primarily on the effectiveness of the organization and management of production, the level of development of cognitive abilities, accumulated knowledge, and the methods for their rational use.

Improving the operational management of production in a competitive environment is a process with several formats, the practical implementation of which is based on scientific concepts, conceptual approaches developed in management based on the provisions enshrined in the relevant local regulatory documents and policies of a machine-building enterprise containing a summary of the main vectors for implementing specific goals and tasks of economic activity to achieve specified indicators of product quality and its efficiency [6, 7].

Today, in the context of aggravation of geopolitical and economic processes, the scientific community and production management are in the process of intensive search for the most effective ways for machine-building enterprises to enter the competitive environment [8, 9]. The riskiness of the situation is due to the fact that certain positive aspects of the development of industry in the country as a whole under these conditions are significantly narrowed, which can lead to stagnation and crisis in national and regional branches of material production, and also, of course, will aggravate already accumulated social problems [10, 11]. At the same time, the competitive environment provides more opportunities to consolidate the Russian competitive quality and price of engineering products on world markets.

The implementation of such opportunities dictates the need to give the management system of a machine-building enterprise proper flexibility and efficiency, the progressiveness of the tools, methods and mechanisms used, and requires their proportionality with international analogues.

The flexibility of operational production management with possible fluctuations and changes in external and internal environmental factors under conditions when a number of machine-building enterprises and material production sectors forecast significant threats and risks can become the basis for achieving the desired level of competitiveness and quality of products.

The tasks of operational management at the workshop level include determining a shift day and acquiring tools, materials and equipment for the workplace, organizing timely equipment changes, recording workloads and minimizing the lost working time, managing labor processes and identifying priority areas of activity based on integrated automation, motivating production personnel in the implementation of production programs and control.

According to the general approach to the interpretation of the term "concept" in economic theory, it is understood as the management process, which consists in determining the goals and objectives, principles and forms, as well as methods and means of system-wide development of the relevant features that form the factors of internal and external influences.

We note some conceptual aspects of optimizing the management of a machine-building enterprise as applied to the operational management of the production of competitive products.

The main stage in the formation of the concept is to improve the management methodology. Traditionally, the improvement of the methodology includes:

- increasing the scientific, technical and settlement-economic level of feasibility of plans;
- application and improvement of the base of progressive norms and technical and economic standards, the use of balance calculations;
- development of a system of applied quantitative and qualitative indicators, etc.
The development of scientifically based forms, principles and methods of operational production management in the control system of a machine-building enterprise, their implementation allows us to identify hidden resources and potentials, streamline and optimize production processes, which leads to a significant increase in the value of choice and implementation of advanced IT technologies.

Reserves for optimization and improvement of operational production management are unused opportunities to reduce in the future the time and cost of products, increase their quality in the volumes necessary for the desired positioning in the sales markets.

4. Results
The use of modern IT technologies allows using reserves to improve operational management of production, which can be distinguished by the following groups:

- Organizational reserves: reducing time spent on the implementation of operational management processes by improving the system-wide organization;
- Technical reserves: cost reduction due to the introduction and application of new technologies, software and technical means of operational management;
- Quality reserves: reducing time and financial costs by improving the quality of operational management processes based on the use of advanced solutions.

For the purposes of this study, we will not disclose in detail all possible conceptual approaches for optimizing the operational management of the competitive production of machine-building enterprises, and based on the foregoing, we will consider in more detail their connecting and unifying aspects of introducing progressive IT support.

5. Discussion
Modern IT support is a combination of various IT used in the economic activity of a machine-building enterprise, the balanced integration of which on the basis of the corresponding software product and hardware provides the necessary competitiveness of the products.

The development of adequate IT support is a rather complicated and expensive process, and also requires a thorough approach and skills for its implementation. Traditionally, in the field of IT, the implementation of such projects involves the completion of the following main stages:

- Predesign (setting goals and objectives, examining and implementing the current situation, determining the necessary reorganization);
- Design (engineering, selection of necessary resources, hardware, software, implementation);
- Post-project (operation and maintenance).

It is practically impossible for a machine-building enterprise to solve such a problem on its own, and the choice of the optimal configuration is a determining factor for the success of the implementation. This requires taking into account the whole variety of factors of the external and internal environment, as well as determining a reasonable price-quality ratio taking into account long-term development goals.

Improving IT support in accordance with our understanding should be carried out in stages within the framework of the general program, on the basis of which a competitive strategy of engineering enterprises is developed.

6. Conclusions
It can be stated that the existing experience in the operational management of production at machine-building enterprises is based on the experience of a centrally regulated economy and reflects organizational and planning procedures at the national and sectoral levels. This also explains the current shortcomings of management: analysis and forecast, development strategies and evaluation of competitive factors in the competitive environment are not the main factors.

Summarizing modern approaches and views on theory, concepts and practice, it was determined that the operational management of competitive production at a machine-building enterprise, as a specific
production management subsystem based on adaptive IT support, integrating and coordinating the current tasks of the functional subsystem units for the rational distribution of production resources in the organizational, economic, temporal and spatial horizons of the deployment of technological capacity and equipment, which is interconnected with the implementation of long-term and medium-term prospects, goals and directions of development of a machine-building enterprise are focused on the production of popular products.

At the first stage of the implementation of the proposed study of the conceptual approach, a survey is carried out of the engineering enterprise, its organizational and functional structure, the achieved development level and the forecast of future vision, taking into account the influence of various factors of the external and internal environment. This makes it possible to select IT-software that optimally meets the objectives of improvement.

The second stage involves the development of an organizational and economic model focused on a system of interconnected use of key principles, methods, tools, forms and processes of operational management of the competitive production of machine-building enterprises.

The third stage is to develop practical recommendations for improving operational production management, in particular, for implementing and adapting selected IT maintenance to support the implementation of the competitive strategy of engineering enterprises based on a combination of long-term, medium-term and short-term planning, organizing the production of functional subsystems by establishing balanced relationships, motivation, personnel management, controlling.

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