

The impact of information resource management of a high-tech enterprise of the aircraft industry on its competitiveness in conditions of increased economic security requirements

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Abstract. In this paper, the problem of ensuring the competitiveness of a high-tech enterprise of the aircraft industry by optimal management of its information and other basic resources in conditions of increased economic security requirements is investigated. Modern approaches to the creation of an effective management system for high-tech enterprises of the aircraft industry based on the results of the analysis of its economic and mathematical model are analyzed. As a result of the conducted research, the task of creating a special information subsystem for managing information and other basic resources of a high-tech enterprise in the aircraft industry (using the example of material, technical and information components) was formulated and solved in order to modernize the management activities of such an enterprise as a component of the overall system for ensuring its competitiveness in foreign and domestic markets in conditions of increased economic security requirements.

1 Introduction

Modern effective management of a high-tech enterprise of the aircraft industry is possible only on the basis of a new level of management culture, which involves the use of economic and mathematical methods, computer technology and advanced information technologies in control systems of different levels.

This makes it possible to solve qualitatively new management tasks related to the complexity and dynamics of the economy, to maintain and increase the competitiveness of the enterprise in the external and internal markets of high-tech aviation products in the conditions of modern increased requirements of economic security.

2 Theoretical basis

In recent decades, a systematic approach has prevailed in the world practice of ensuring the

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competitiveness and economic security of high-tech enterprises in the aircraft industry.

Its essence lies in:

- a thorough study of the aspects of the functioning of high-tech enterprises of the aircraft industry on the basis of pre-determined criteria;
- the construction of an economic (economic-mathematical) model of the functioning of such an enterprise and its thorough analysis;
- synthesis of economic security management systems of high-tech enterprises of the aircraft industry.

Many of the tasks that arise when analyzing the functioning of high-tech enterprises of the aircraft industry (and in a broad sense, economic facilities) in order to ensure their competitiveness in the global and domestic market and, as a result, to ensure their economic security, are multivariate. Since not all options are equally effective, you have to choose the most optimal one among the many possible ones. A significant part of such tasks has been solved for a long time based on common sense and experience. At the same time, there was no certainty that the found option was the best.

Modern economic methods are directly related to the methodology of economic and mathematical modeling and the scientifically based classification of the tasks of analyzing the financial and economic activities of a manufacturing enterprise.

Let's list the main types of economic models describing both the object as a whole and its components:

- factor econometric models;
- optimization models;
- balance models;
- extrapolation models;
- dynamic models;
- methods, using expert assessments;
- network models;
- game theory models;
- models of queuing systems.

When analyzing the influence of individual factors on the behavior of a system (object), three main types of economic and mathematical models are used:

- additive models;
- multiplicative models;
- multiple models,
- as well as their combinations (mixed models).

Recently, multifactor multiplicative models have also become widespread in the analysis of economic activity, since they allow us to study the influence of a significant number of factors, including risk-forming ones, on the generalizing indicators of the enterprise's activity, and thereby achieve greater depth and accuracy of analysis.

To solve the problem of ensuring the competitiveness of a high-tech enterprise of the aircraft industry in conditions of increased economic security requirements by optimal management of its main types of resources (and information resources are considered by the author of the article as one of the most important resources of a high-tech enterprise of the aircraft industry), it seems necessary to first determine the very content of the concept of "enterprise resources", as well as classify them appropriately.

3 Review of literary sources

The following definition is given in the Soviet Encyclopedic Dictionary edited by A.M. Prokhorov: "Resources (from the French resource – auxiliary means) – cash, reserves,

values, opportunities, sources of funds, income (for example, natural resources, economic resources).

A similar interpretation can be found in the Great Encyclopedic Dictionary edited by A.M. Prokhorov and in the Great Economic Dictionary edited by A.N. Azriliyan.

In these definitions, two main groups of resources can be distinguished: natural and economic. Let's take a closer look at the term "economic resources".

The following definition is given in J. Black's Explanatory Dictionary of Economics: "Resources - this concept includes everything that contributes to economic activity: natural resources (terrestrial, fossil, underwater); human resources, including abilities and qualifications; industrial goods, or human-made means of production. Economics can be defined as the science of resource allocation."

A.N. Rodnikov offers the following interpretation of the term: "Resource (scheduled operating time; anticipated working life) – the established service life of the technical device, after which it is subject to referral for repair or write-off." In the same dictionary we find such a definition: "Resources are elements of the economic system used in the process of production consumption, or factors of production: labor (workers, engineers, organizers of production), land (mineral reserves, forests), capital (buildings and structures, technological equipment, vehicles). The term "resources" also refers to non-productive products and services intended for personal consumption".

Thus, you can see the value of the number in which the concept under study is used. Economic science is characterized by the use of the word "resources" in the plural, while "resource" in the singular is used as a technical characteristic of an object.

The economic encyclopedia under the leadership of L. I. Abalkin provides the following definition: "Economic resources are a fundamental concept of economic theory, meaning sources, means of ensuring production".

In Economic theory (Economics - McConnell K.R., Bru S.L. - Textbook, Publishing House: INFRA-M, 2003. Source: <https://instituciones.com/download/books/805-economics.html>, © Economic Portal.) for a long time, it was customary to divide resources into four groups:

- natural - fundamentally suitable for use in the production of natural forces and substances, among which there are "inexhaustible" and "exhaustible" (and in the latter – "renewable" and "non-renewable");
- material – all man-made "man-made" means of production, (which, therefore, are themselves the result of production);
- labor – the working-age population, which in the "resource" aspect is usually assessed by three parameters: socio-demographic, professional qualification and cultural and educational;
- financial – funds that the company is able to allocate for the organization of production.

This approach is also found in many works of the modern period, which is quite reasonable, since in the management of material resources, an important role is played by assessing the effectiveness of their use based on the cost assessment of both the resources themselves and the result of production activities.

As for information resources, such a definition does not apply here.

4 Methodology

When analyzing modern approaches to creating an effective management system for a high-tech enterprise of the aircraft industry based on the results of the analysis of its economic and mathematical model, the following methods were used: the theory of managerial decision-making, methods of logical, economic, statistical and system analysis,

the method of expert assessments, methods and procedures of information and production management.

The main sources of initial information were regulatory and instructional and methodological documents of the Government of the Russian Federation, the Ministry of Industry and Trade of Russia and its institutes, state programs of the Russian Federation regulating the production, economic and financial activities of high-tech enterprises of the aircraft industry, etc., as well as materials of Russian and foreign scientific printed and electronic periodicals.

5 Results

This article is devoted to solving the problem of creating an information subsystem for optimal management of information and other basic resources of a high-tech enterprise of the aircraft industry as an integral part of the system for ensuring its competitiveness in conditions of increased economic security requirements using special mathematical methods of economic cybernetics.

The result of the work done is to develop ways to counter threats to the competitiveness and economic security of a high-tech enterprise in the aircraft industry through finding optimal solutions for managing its information and production and technological resources as one of the most significant components of the overall enterprise management system.

For this purpose, the task of creating a special information subsystem for managing the main types of resources of a high-tech enterprise of the aircraft industry (using the example of the material and technical component) has been formulated and solved in order to modernize the management activities of this enterprise as a component of the overall system for ensuring its competitiveness in foreign and domestic markets in conditions of increased economic security requirements.

6 Discussion

To analyze the competitiveness and economic security of a high-tech enterprise of the aircraft industry in modern conditions of innovative and financial conditions in terms of the availability of the main types of resources, as well as optimal management of them, it seems appropriate to use the following classification of resources of such an enterprise:

1. By actual presence (fact of ownership):

- natural;
- material;
- labor (human);
- financial;
- information;
- temporary;
- administrative.

Special mention here deserves informational and administrative, which are usually not accepted to talk about, but which have played and still play a significant and sometimes decisive role in maintaining the competitiveness and economic security of a high-tech enterprise in the aircraft industry under any socio-economic formations.

2. By availability of access:

- limited;
- unlimited.

3. From the point of view of accounting:

- fixed assets;

- working capital;
- unaccountable or difficult to learn in monetary terms.

4. In relation to the functioning of a high-tech enterprise of the aircraft industry, as a separate economic entity, are divided into resources:

- internal;
- external.

Thus, when analyzing the competitiveness of a high-tech enterprise in the aircraft industry, taking into account the increased requirements of economic security, the resources of such an enterprise will be understood as a set of natural, material, technical, labor, financial, information, time resources and opportunities that are used by the enterprise in the process of creating high-tech aircraft products, works, services and other values.

Let's consider the enlarged business process of the movement of the main types of resources (using the example of material and technical resources) at a high-tech enterprise of the aircraft industry before (Figure 1) and after (Figure 2) the introduction of a subsystem for managing the movement of material and technical resources on the basis of 1C: UPP 8.0.

The typical structure of the production activity of a high - tech enterprise of the aircraft industry is as follows:

- development and production of high-tech aviation products, works, services;
- testing of high-tech aviation products;
- after-sales service of high-tech aviation products;
- disposal of high-tech aviation products;
- performing research and development work (R&D);
- participation in the development of state programs regarding the development of the scientific and technical base and the development and production of high-tech aviation products, works, services, as well as the development of enterprise development plans in accordance with these programs;
- development of state and industry standards, as well as enterprise standards for the development and production of high-tech aviation products, works, services, R&D and testing, etc.

The economic essence of the task of creating a special information subsystem for managing the main types of resources of a high-tech enterprise of the aircraft industry (on the example of the material and technical component) in order to modernize the management activities of this enterprise as a component of the overall system for ensuring its competitiveness in foreign and domestic markets in conditions of increased economic security requirements is to develop and implement an information management subsystem that allows you to receive, store, process and distribute data on the progress of the provision of the main types of resources of the workshops of the main and auxiliary production of the enterprise.

The users of the system being developed will be specialists who will be able to record the movement of these types of resources in the enterprise, working with the database directly, without contacting auxiliary units, for example, an Information Center, which will get rid of secondary documentation and possible errors in it. Moreover, some of the criteria imposed on such an information subsystem, such as an accessible and user-friendly interface, low cost of service, can be called limitations.

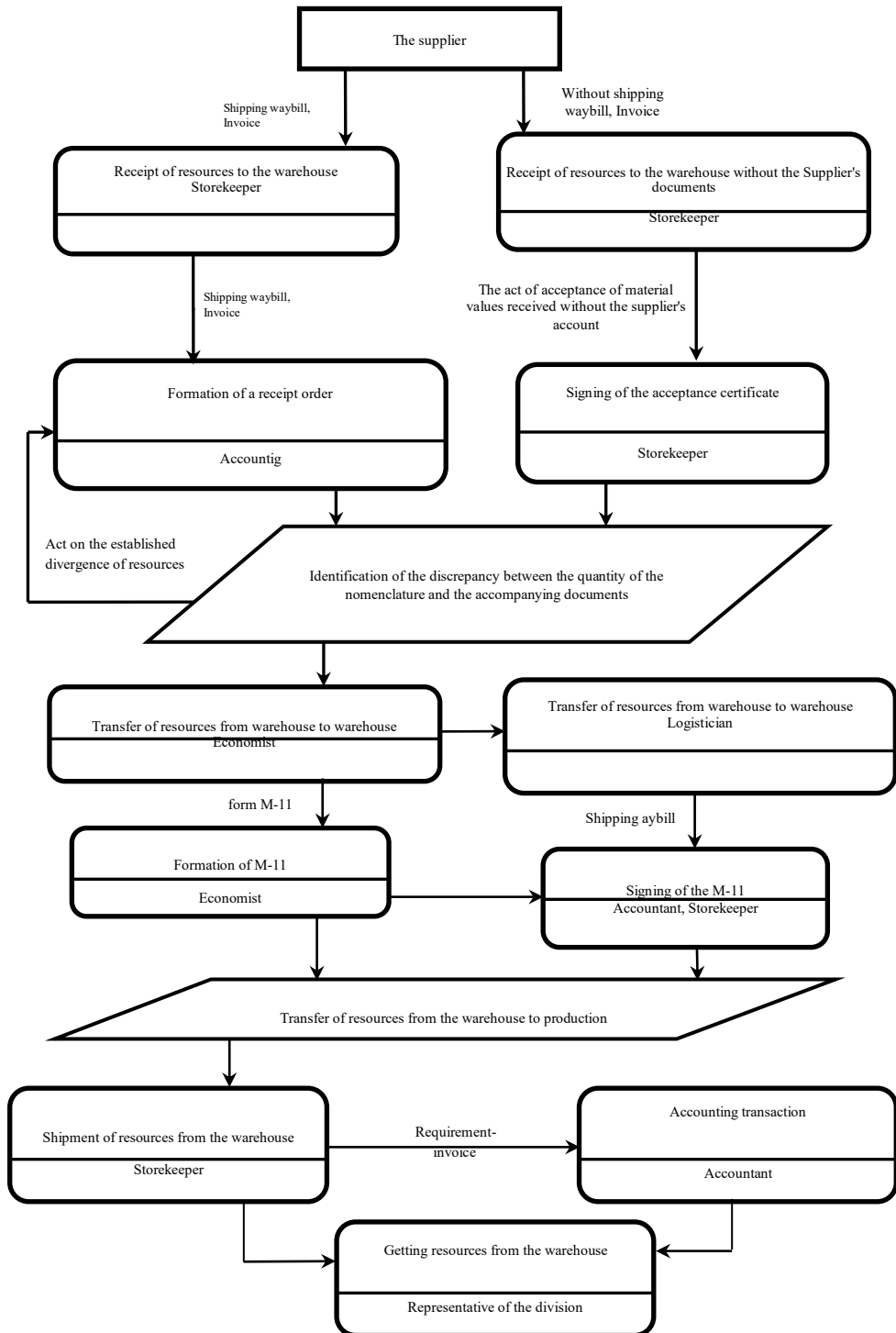


Fig. 1. The enlarged business process of the movement of material and technical resources at a high-tech enterprise of the aircraft industry before the introduction on the basis of IC: UPP 8.0 of the information subsystem for managing the movement of material and technical resources in the warehouse and their entry into production.

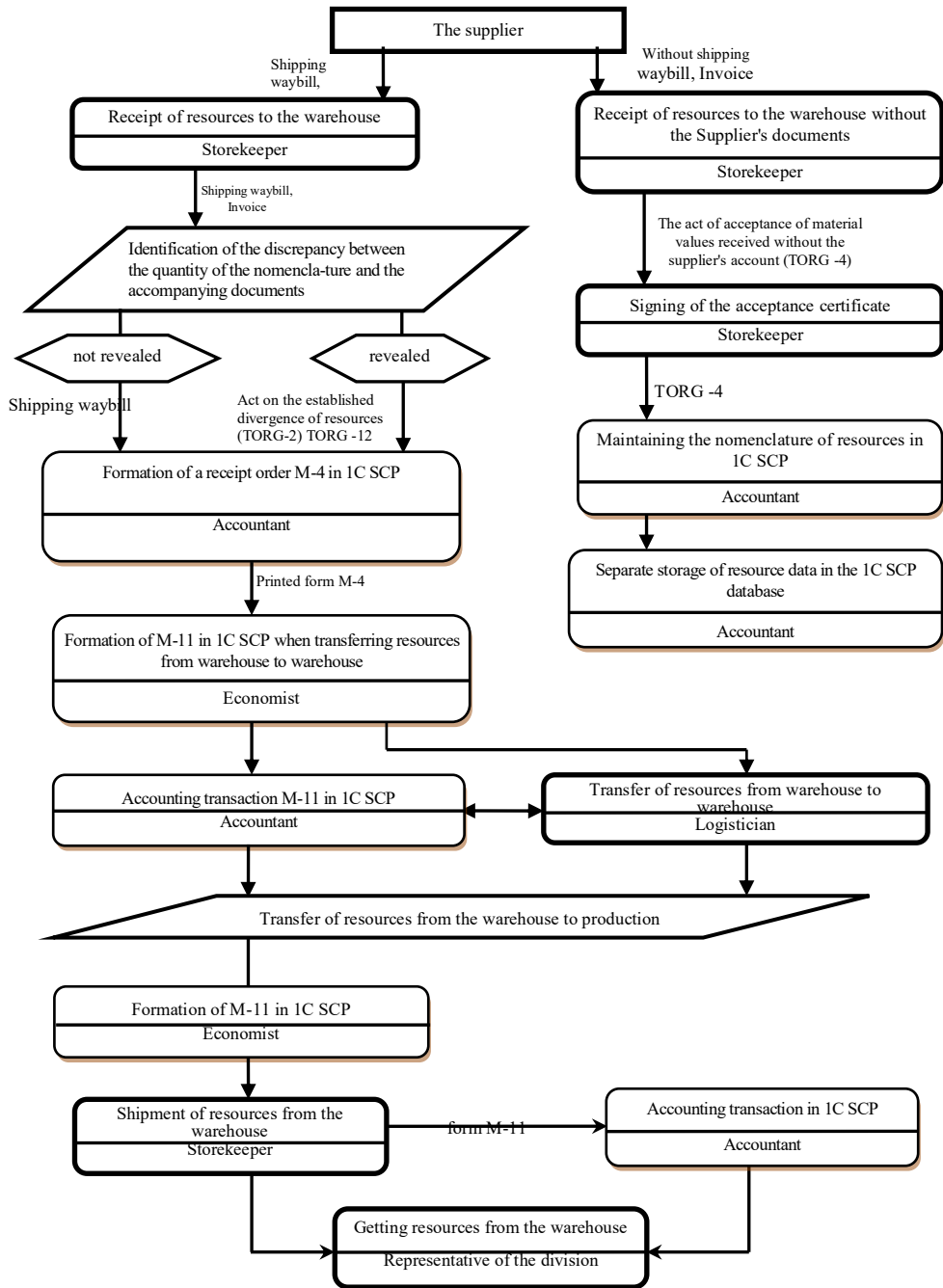


Fig. 2. The enlarged business process of the movement of material and technical resources at a high-tech enterprise of the aircraft industry after the introduction on the basis of IC: UPP 8.0 of the information subsystem for managing the movement of material and technical resources in the warehouse and their entry into production.

The main task of creating a special information subsystem for managing the main types of resources of a high-tech enterprise of the aircraft industry (on the example of the material and technical component) in order to modernize the management activities of this

enterprise as a component of the overall system for ensuring its competitiveness in foreign and domestic markets in conditions of increased economic security requirements is the organization of accounting for the main types of resources of the enterprise directly by users themselves. This task can be solved using the following software products: 1C: Enterprise 8.0 or its more advanced version 1C: Corporation, SAP ERP, etc.

7 Conclusion

Thus, the analysis of the activities of high-tech enterprises of the aircraft industry using special economic and mathematical methods and models allows us to identify problems associated with the development of an information subsystem for optimal management of the main types of resources of such enterprises as an integral part of the system to ensure their competitiveness and, as a consequence, economic security.

The creation of a special information subsystem for managing the main types of resources of a high-tech enterprise of the aircraft industry in order to modernize the management activities of this enterprise will allow more efficient use of information and other main types of resources of this enterprise, as well as ensure its competitiveness in foreign and domestic markets in conditions of increased economic security requirements.

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