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# Methods of business processes competitiveness increasing of the rocket and space industry enterprise

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**Abstract.** This article observes problems of the branches of the Russian defense industry complex. The short comparative analysis of scientific approaches and applied methods of management of innovative business processes of the enterprise of the rocket and space industry is carried out. Features and area of assignment of a system method of management and enhancement of innovative business processes of the enterprise and the method based on "end-to-end" business processes are provided. Need of transition from functional approach to enterprise management, widespread in the last century, to process-based management is proved. The algorithm for increasing the competitiveness of business processes of an enterprise of rocket and space industry is considered in the article. It allows to consider the nature and conditions of implementation of innovative activities and provide not only the effective use of limited resources, but also the sustainable development of the rocket and space industry enterprise and an industry in general, allowing to successfully solve problems of increase in defense capability of the state. The need of control technique development by innovative business processes of the rocket and space industry enterprise, necessary for increase in their competitiveness, is proved.

## 1. Introduction

The enterprise scales and the knowledge-intensive production cause high requirements to the rocket and space industry (RSI) management. The rocket and space industry is the leading knowledge-intensive industry of national economy. The control of innovative business processes of such entities demands from modern managers a high level of proficiency in modern technologies and instruments of management.

Today the RSI of Russia is influenced by problems, general for all industries of Russian defense industry (RDI) [1, 2]:

- Decrease in personnel potential.
- Increase in cost value and fall of profitability of the products.
- Inefficient approaches to management of the knowledge-intensive entity.



The widespread functional approach to management based on an old paradigm of management in the last decades ceased to correspond to new economic conditions. As the result, the shortcomings of the functional management of the organization were shown:

- Lack of consumer focus.
- Weak authority delegation and responsibility.
- Bureaucracy.
- difficult organizational structure.
- Absence responsible for a resulting effect.

The entities of RDI entered the world market of the knowledge-intensive products and therefore the importance of effective methods of management in the conditions of market economy determines not only competitiveness of the organization, but also often resolves an issue of survival of domestic enterprises of RSI in the conditions of the world competition.

## **2. Management methods of RSI enterprises' innovative business processes**

There are two main methods of enterprise business processes management. The first means that in the beginning it is necessary to allocate, classify and describe business processes within the functional management structure that, in most cases, exist [2]. After that the transition to a process management structure is gradually performed. This system method is based on the following basic provisions:

- Reveal and classify the processes necessary for the system of management.
- Determine the criteria and methods necessary for ensuring effectiveness of business processes of an enterprise.
- Determine the sequence of these processes and their interrelation.
- Provide availability of information and resources necessary for support of the course of implementation of these processes and their monitoring.
- Observe, measure and analyse business processes.
- Implement the actions necessary for achieving planned results and constant improvement of these business processes.

The second method is based on allocation "end-to-end" business processes in an organization. Business process is a description of a sequence of works performed without fixing them to subdivisions of an enterprise, executors, incoming and outgoing documentation. Then, formalized "end-to-end" business processes are put into the new organizational structure (most often – matrix type) constructed on process management.

On the basis of this method the description has the following sequence:

- Creating models of real / existing business processes.
- Performing an analysis of these models.
- Developing ideal models of business processes.
- Carrying out reorganization of real activities on a basis of ideal models.
- Creating a new organizational structure on a basis of the process approach to management.

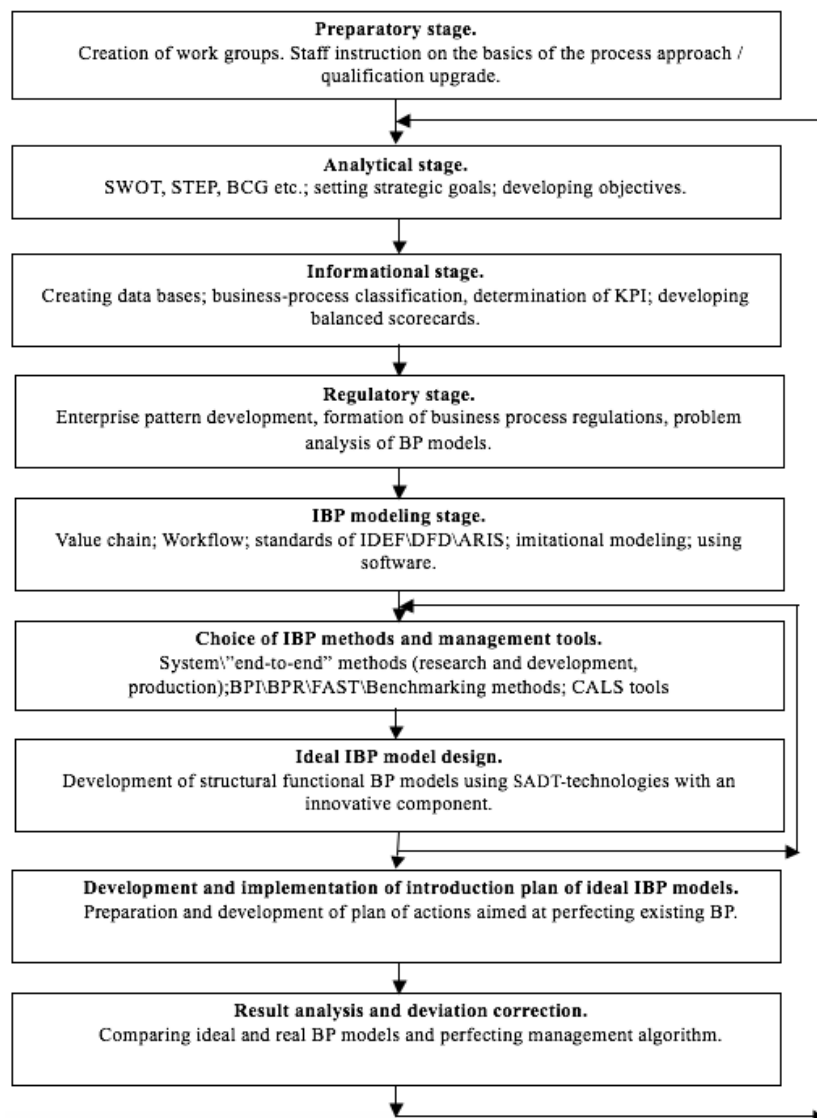
## **3. Algorithm of business processes competitiveness increase for RSI enterprise**

Speaking about the need of development of methods of management of the enterprise innovative business processes, it is necessary to consider an algorithm (figure 1) of increasing their competitiveness on the basis of the use of progressive methods and management tools of business processes [9-12].

At the information stage, extensive databases of business processes are created that fully describe the activities of a knowledge-intensive enterprise. Undoubtedly, this step is time consuming and takes place in several stages.

The data is collected in the following order:

- Formalization of information collection goals.
- Analysis and selection of existing sources of information.
- Planning for the collection and processing of information.
- Preparation of the necessary documentation.
- Preparing for the interview.
- Preliminary collection and analysis of information.
- Coordination of interview time in the departments.
- Conducting interviews in units.
- Processing of the received information.
- Verification of the information received for correctness.



**Figure 1.** Basic certification functions.

Interviews, as the main means of collecting formalized data, should be conducted from 1 to 2 hours during the working day. The interviewer must clearly understand the purpose of the interview, understand the role of the head of the department before the interview, include a limited number of pre-arranged questions in the interview, and be familiar with the documentation on the issues at hand.

The working group needs to determine the units of measurement of each indicator and their significance for a given situation. In conclusion, target values are developed. A guideline for their selection can be: indicators of similar activities of competitors, data of dissatisfaction and requirements of clients of the process, data of financial and economic analysis. The obtained values of the indicators are presented in a list, table or graphically and are considered by management.

When describing a real model, the actions of specific employees of the enterprise, as well as their decisions, should be reflected. For each step, it is necessary to closely monitor the logical level of description, i.e. each time clearly visualize the top level of regulation, or already nested business processes of the second and / or third level. It is necessary to describe those operations, actions and work that are not just formalized, but are actually carried out.

Any business process must be analyzed in accordance with the specified requirements. These requirements can be established both by the enterprise and external organizations. In addition, each business process can be compared with similar processes in other enterprises. In this case, you can use the method of benchmarking business processes, which is to introduce templates of the best examples of processes that are effectively implemented by competitors.

The need for successful operation in a highly competitive environment imposes its own requirements on the efficiency of managing innovative business processes of enterprises of the PSC. The solution to the problem of improving management efficiency is inextricably linked with the provision of information support for business processes. One of the main tools to solve this problem and the regulation of innovative business processes of the enterprise.

The procedure of implementation of the improved business processes requires further study and approbation as it is the big labor-consuming task requiring carrying out separate scientific researches and practical developments. For now, we have only outlined this step in general terms as without it BP management methodology of RSI enterprise would be incomplete.

For creation of an effective RSI enterprise management system it is necessary to use modern methods of increasing the competitiveness of innovative business processes as innovative activities are a basis of the knowledge-intensive enterprise. Development of a methodology for managing innovative business processes is based on development, analysis and use of management tools by business processes of the RSI enterprise [13-15].

#### **4. Conclusion**

The condition of innovative and potential production at the RSI enterprises, characterized by insufficient competitiveness in the foreign markets, inefficient management of most the knowledge-intensive enterprises and also insufficient level of planned amounts of budget investments on development of the defense industry complex lead to the need of development of innovative business processes of the RSI enterprises, [6]. It will allow to consider nature and conditions of implementation of innovative activities, to provide not only effective use of limited resources, but also the sustainable development of the RSI enterprises and the industry in general allowing to solve the problems of increasing in defense capability of the state successfully.

In spite of the fact that the methodology offered in this article is based on the known principles, a part from which is already successfully used by the enterprises, it is new as allows the RSI enterprises to pass to the process management of innovative activities, [7]. As a result, the enterprise can enhance innovative business processes on a fixed basis that allows it to raise the competitiveness.

#### **References**

- [1] Baklanov A G 2007 *Market and marketing of aerospace products in conditions of instability*

- (Moscow: KDU)
- [2] Batkovskiy A M, Makarov Y N, Semenova E G, Fomina A V and Khrustalev E I 2015 Economic protection of secure operation and development of companies in the rocket and space industry *Mediterranean Journal of Social Sciences* **6(4)** 414
  - [3] Becker J, Vilкова L, Taratukhina V, Kugeler M and Rosemann M 2007 *Process Management* (Moscow: Eksmo)
  - [4] Boyko A A, Kukartsev V V, Tynchenko V S, Nasyrov I R and Kukartsev V A 2018 State and trends of depreciation strategy of rocket and space industry enterprises formation *International Conference "Actual Issues of Mechanical Engineering" (AIME 2018) - Advances in Engineering Research* **157** 607-11
  - [5] Chubai V M 2010 Analysis of innovation potential of a machine-building enterprise in the process of formation and implementation of innovation strategy *Actual problems of economics* **110** 183-90
  - [6] Danilina H and Mingaleva Z 2013 Improving of innovation potential efficiency of industrial enterprises *Middle East Journal of Scientific Research* **13** 191-4
  - [7] Pabian A and Pabian B 2014 Sustainable management of an enterprise - functional approach *Polish Journal of Management Studies* **10(1)** 98-107
  - [8] Gorlevskiya K I and Ogurchenok I V 2014 Scientific approaches to management of business processes of the enterprise of the space-rocket industry *Current problems of aircraft and astronautics* **2(10)** 113-4
  - [9] Gorlevsky K I and Kukartsev A V 2014 Regulation of innovative business processes of the enterprise of the rocket and space industry *Bulletin of the Siberian State Aerospace University* **1(53)** 194-8
  - [10] Kukartsev A V and Gorlevsky K I 2014 Principles of management of innovative business processes of an enterprise in the rocket and space industry *Economics and management of control systems* **1(11)** 44-52
  - [11] Meskon M, Albert M and Hedouri F 2009 *Fundamentals of Management* (Moscow: Williams)
  - [12] Moller C 2006 Enterprise systems management and innovation: Impact on the research agenda *8th International Conference on Enterprise Information Systems (ICEIS 2006) - Proceedings DISI* 87-94
  - [13] Repin V and Eliferov V 2013 *Process approach to management. Business process modelling* (Moscow: Mann, Ivanov and Ferber)
  - [14] Tarasenko M V 1996 Evolution of the Soviet space industry *Acta astronautica* **38(4-8)** 667-73
  - [15] Yeremeev D V 2013 Conceptual model of the relationship of competitiveness of high-tech enterprises and its innovative potential *Bulletin of Magnitogorsk State Technical University* **3** 101-6