

# Modeling the Development of Organization Management System

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## Abstract

Organization's management system consists of various structural elements. From the position of the functional approach, the structural unit of management activity is functional task management, the realization of which in the course of activities designed control technology. Functioning of many systems management processes and sub-processes is considered. A typical implementation of this act is to solve the set of specific management tasks to achieve the desired goal of a fixed initial situation. The contemporary development of organizations is determined by the necessity to respond to the current challenges and the market trends. In order to react adequately, it is important to use effective means to rebuild the systems of managing the economic systems referred to as organizations. We present a model of organization management system (OMS), and a model of development of organizational processes management system. We review the stages of the said models, including both the conceptual and the technological aspects of organization development based on reengineering. We emphasize the basic advantages of the described models.

**Keywords:** organization, management system, reengineering, processes, managerial tasks, procedures

## 1. Introduction

Operation and sometimes even survival of an organization in the market environment depends on the timeliness and thoroughness of its renewal. The most important part in this process is taken by rebuilding and optimization of the OMS, development of its mechanisms of operation and evolution in the competitive business environment (Hammer & Champy, 1993).

There are a few concepts of organizational development, from gradual improvement to a radical change of management systems and their components. Reengineering is described as “the most passionate management concept since movement for quality” and as “one of the key management concepts of 1990s”. Its foundation is usually referred to an article written by M. Hammer (Hammer & Champy, 1993). The work (Harrington, 1991) provides the most detailed coverage of reengineering concept. This concept was further developed in the works (Davenport, 1993) and (Jeston & Nelis, 2008). The following renowned Russian and foreign scientists contributed a lot to the development of this area: M. D. Aistova, F. Guyar, T. Davenport, I. I. Mazur, J. Nelis, E. G. Oikhman, M. Robson, F. Ullah, D. Harrington, V. D. Shapiro, D. Short.

## 2. Method

Reengineering is a redesign of an organization, which becomes possible on the basis of scientific achievements upon recognizing the need for modernization or development and orientation at other values (Harrington, 1991).

Reengineering is applied in three situations (Davenport, 1993):

- 1) Organization is in a deep crisis, which is reflected in a very high level of costs, mass loss of customers, loss of quality and competitiveness of products, loss of skilled professionals, etc.;
- 2) The condition of the organization can be considered satisfactory, but its business forecasts for the future are unfavorable, because the organization faces undesirable trends regarding competitiveness, profitability, etc.;
- 3) The organization is successful and aggressive, and, as a result, it grows fast, and, therefore, its strategy is to leave the competitors far behind and to create unique competitive advantages.

For all the various methods of reforming the OMS, there are still problems in creating such tools, as they have to meet the goals and objectives of the organization, and at the same time, they have to be able to change flexibly

under the influence of market factors, and even to confront them sometimes. The existing models of systems managing the OMS development focus mostly on business processes and do not deal with functional elements of the organization.

### 3. Model Development Organization's Management System: A Programmatic Approach

Universal model of development, based on reengineering, is shown in Figure 1. This said, the methodology of OMS development and its key elements shall be used in the context of the situation prevailing at the market, and shall be applied to resolve the problems identified when analyzing the organization.

The presented model is based on the *program approach*. The program approach proceeds from the present problems and the opportunities to solve them using the available tools. As compared to the project approach based on what the situation should be, the program approach is based on the real situation and involves choosing the changes that lead to the maximum result.

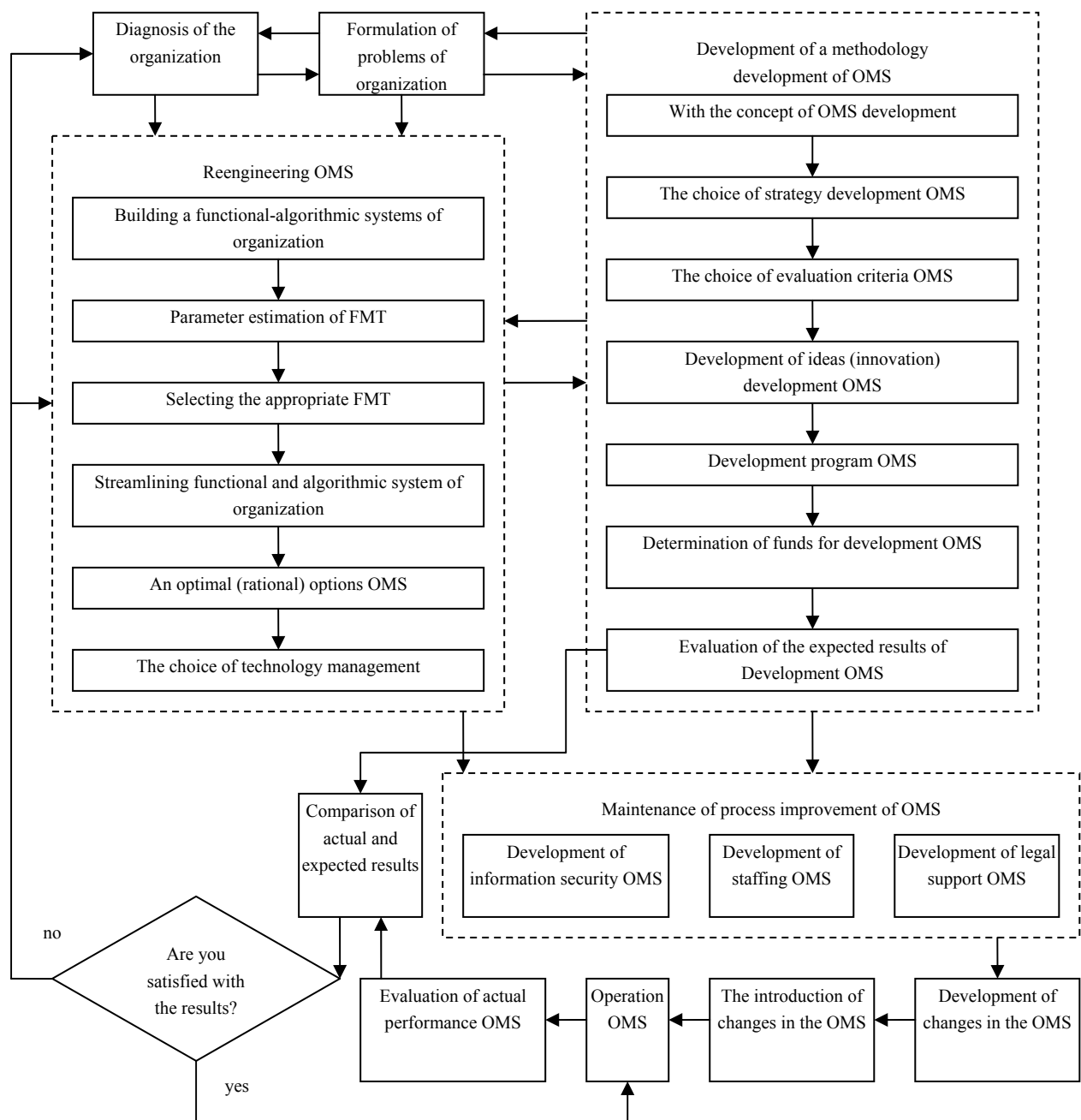


Figure 1. Model of development OMS, based on reengineering

Specific objectives, measures and mechanisms for achieving them are defined during the program implementation, and the target of each stage is determined immediately prior to its implementation, based on the analysis of the current situation and the results of the previous stage. Only the *concept* and *strategy* of the program are determined in advance. The present model uses a program approach, since the direction of reengineering-based OMS development is determined by the existing problems, and the program of solving such problems is adjusted in accordance with the ongoing dynamics of the environment and the capabilities of the organization.

The concept includes a description of the main provisions of OMS development project, and the means (tools) to be used for the implementation of a particular embodiment thereof. The OMS development concept includes the basic provisions on “what to do” and “how to do” the OMS redesign, which requires solving the following tasks:

- develop innovative proposals, enabling the organization to achieve high competitiveness;
- introduce innovative technologies to produce goods with new consumer properties;
- focus on flexibility of management thinking in the event of conflicts, barriers, and deadlocks.

Innovations provide a specific way of implementing a particular variant of concept and strategy of the organization development.

The criteria used for solving the “low level” tasks should match logically the criteria used at the higher level. For the criteria to lead to reasonable results, it is necessary to exclude the possibility of imposing some additional restrictions on them. The main criteria of OMS development include such an increment of income and profits, which covers the costs for introduction of innovative proposals.

*Diagnosis of the organization* involves defining the point of reference of the study, the starting platform for further work. The main elements of the organization state are the attitudes (points of view), objects, various connections, external influences, structures, scopes, phenomena (processes, circumstances, events), temporal aspects. We propose a method of diagnosis relying on the same methodological basis as the OMS development program.

Any problem is defined by two situations (conditions): the ideal and the real. The ideal (desired) situation is formulated in terms of goals, since the top managers of the organization are not satisfied with the actual situation (e.g., sales, profit margin).

Virtually any problem can be represented as a combination of its constituent elements which are often called tasks. A task is a certain process, the fulfillment of which is associated with some procedures (cognitive, action-related, etc.). The methods for solving the problems are usually sought in a particular area of application or expertise.

The main areas included in the OMS development program are as follows:

- development of new products;
- implementation of measures to improve the quality of products / services;
- improving the efficiency of management and innovation activities;
- ensuring the completeness and rationalization of the functional structure;
- ensuring the optimum number of employees;
- improving the informational, hardware and software support of technological developments;
- staff development;
- improving the working conditions and the system of remuneration.

The program of OMS development includes only the areas that are essential for solving the detected problems with the appropriate resources of the organization. Other areas provide a prospective outlook for further study.

In order to reform the existing OMS or to create a new one, a *functional and algorithmic system of organization* (FASO) shall be established. This system provides for selecting new functional management tasks (FMT) to be addressed in the organization to solve the identified problems.

All FMT, chosen to be implemented in the organization, are evaluated with the expediency parameter, defined on the basis of the parameters of importance (utility) and complexity of implementation which, in turn, are integral and consist of several indicators.

The FASO structure is a directed graph with the nodes representing FMT, connected with information links. The FASO, constructed in such a way, can be arranged by information links, levels, and functional areas. Graph arrangement helps represent the FASO in a form suitable for incorporation of new FMT in the organization. The functional areas of the organization are formed at the weak connections to determine the organizational structure.

*The selection of the most appropriate tasks* can be performed in two ways: by using the heuristic algorithm or the algorithm based on the Bellman's optimality principle (Bellman, 1960). The new FMT can be deployed in the organization in several phases due to the lack of resources.

After the FASO is developed and the new FMT are classified to a particular area, one of the well-known organizational structures is established.

*FMT distribution by task owners* within the organization is an important procedure and is performed on the basis of a directed graph, the available human resources and the labor efforts for performing FMT. For this purpose, we developed two algorithms: one is based on the Brooks method, the other - on the purposeful enumeration method of Lemke and Spielberg (Kaufmann & Henry-Labordere, 1977). FMT are distributed in accordance with the qualification of specialists, which ensures that the tasks are fulfilled in time and with the due quality.

The optimal (rational) variant of OMS development is chosen on the basis of several competing options of OMS development according to the previously selected criteria.

Management technologies are applied in particular situations to improve the efficiency of FMT solutions (Gerasimov, 2010). For example, the fulfilment of an FMT "conclusion of a contract" requires using the management technologies (meetings, negotiations, presentations), alignment and implementation of a sequence of specific operations, sometimes under time pressure. Therefore, if a specialist has the experience in using standard management techniques, it should be easier for him to establish a new non-standard technology.

Using the management technologies requires skilled professionals, the willingness of staff to adopt the technologies, and the evaluation of social and psychological characteristics of staff and partners.

As a result of OMS development, the interconnected chains of tasks are defined, the specialists of the organization learn how to implement FMT and how to use the relevant management techniques to fulfill those FMT, and the tasks are assigned objectively to the units specifying the standards and samples of their fulfilment. For this purpose, the following activities are performed: new units are formed, the specialists are appointed to new positions, the staff arrangement is changed, job descriptions are changed, new tasks are assigned to the units, and the tasks are distributed.

The main expected results of OMS development include the change of quantitative and qualitative indicators of the organization and its subsidiaries. These results may be of several types: economic, material, informational, labor-related, social, psychological, and others. Each type is characterized by the corresponding parameters.

In order to determine the actual results of OMS development, the indicators selected in the previous step are evaluated. While no problems usually occur with recording and interpretation of quantitative indicators, the quality indicators may be associated with some difficulties. The parameters shall be registered with the help of questionnaires, checklists and tests which should indicate the new values of social and psychological indicators associated with the change of management of the organization.

The comparison of the expected and the actual results reveal the gains and losses resulting from the OMS development, and major market trends. The analysis performed shall conclude with the definition of activities to help the organization benefit from the OMS development. It is possible that some subsequent unforeseen deviations are identified. The list of recommendations is submitted to the senior management to assess the situation and to take management decisions.

Some stages of the universal model of OMS development can be performed on the basis of a gaming simulation. The gaming model developed by us allows fulfilling promptly the most important stages of a universal model: to define the problem, to select the criteria for choosing the alternatives of the possible solutions, and to arrange the pattern of handling the problem (Jeston & Nelis, 2008). The gaming model can be replaced by game-meeting, focused on the selection of the best option of a management solution in the process of communication.

#### **4. Model of Development Process Management System**

The *Process Management System (PMS)* is a set of elements designed for the functional processes of the organization, aimed to achieve the goals. In this case, the object of study is the functional processes of the organization (financial management, operations management, quality management, etc.), and the subject of

management is the managing bodies of the organization (the meeting of founders, top management, etc.) (Kaufmann & Henry-Labordere, 1977).

Figure 2 shows a model of PMS development, which is a science-based pathway of improvement of the organization processes.

The core of the development model of the organization PMS is a set of sub-process structuring procedures in the organization that undergo decomposition first to become sub-processes and, ultimately, to become FMT. The interaction of all components of the processes, and then the interaction of the OMS processes themselves is formed on the basis of the identified FMT.

The model of PMS development begins with the order to analyze the PMS of the organization and is considered an intersubordination of several components to be studied in the organization (Kaufmann & Henry-Labordere, 1977):

- defining the development directions of the organization;
- determining the condition of the management system of the organization;
- defining the state of the innovative capacity of the processes in the organization;
- engineering of PMS in the organization.

*Determining the development directions of the organization* includes defining the basic parameters of the organization activities which can be determined before, during, and after reforming the organization.

The development strategy of the organization is to concentrate the resources on specific processes and/or their components and to search for the opportunities to implement them at a high level (Gerasimov, 2010).

The essence of diagnostics of the organization at the level of processes is to define and study the criteria, to measure the basic characteristics reflecting the state of technical systems, economics and finance of a business entity, to predict the possible deviations from stable, medium, standard values, and to prevent violations of the normal mode of operation. Diagnostics of the organization includes defining the evaluation features, choosing the methods of their measurement and characterizing these features according to certain principles, evaluating the revealed deviations from the standard, generally accepted values.

It is extremely important to determine the condition of innovative potential of the organization processes. The concept of “innovative potential” became “a conceptual reflection of the phenomenon of innovative activity”.

Based on our technique, the innovative potential of particular processes (sub-processes) of the organization, needed for its development, are detected (measured). Using this model allows determining the drawbacks of OMS and their causes, which may become the source of information for the development of PMS based on reengineering.

According to the work (Davenport, 1993), when applying the model of PMS engineering, the following elements of the development methodology of the “organization” type economic systems are taken as a basis: model, mechanism, concept, method, technology, etc.

Presentation of the management methodology elements contributes best to the understanding of processes occurring in the organization, and allows designing the system complexes in the organization.

New universal PMS can be constructed at the level of management problems or at the level of sub-processes. This provides a functionally complete composition of FMT, which covers the selected organizational process.

The model of OMS development consists of several blocks. The model starts with receiving the information on the conceptual (methodological) parameters of the organization, i.e. goals, mission, strategy, and policy of the organizational development, as well as the long-range program of the organizational development (Hammer & Champy, 1993).

The PMS development on the basis of reengineering is a process of identifying the management goals, which are ignored in the organization or fulfilled insufficiently. Identifying these elements is a key step of the present model, since they are to bring the expected results of OMS development.

Forecast of the results of OMS development simulation is an extremely important factor in determining and studying the basic indicators of the organization performance. It can be prepared by an expert group: staff of the organization or a professional consulting company.

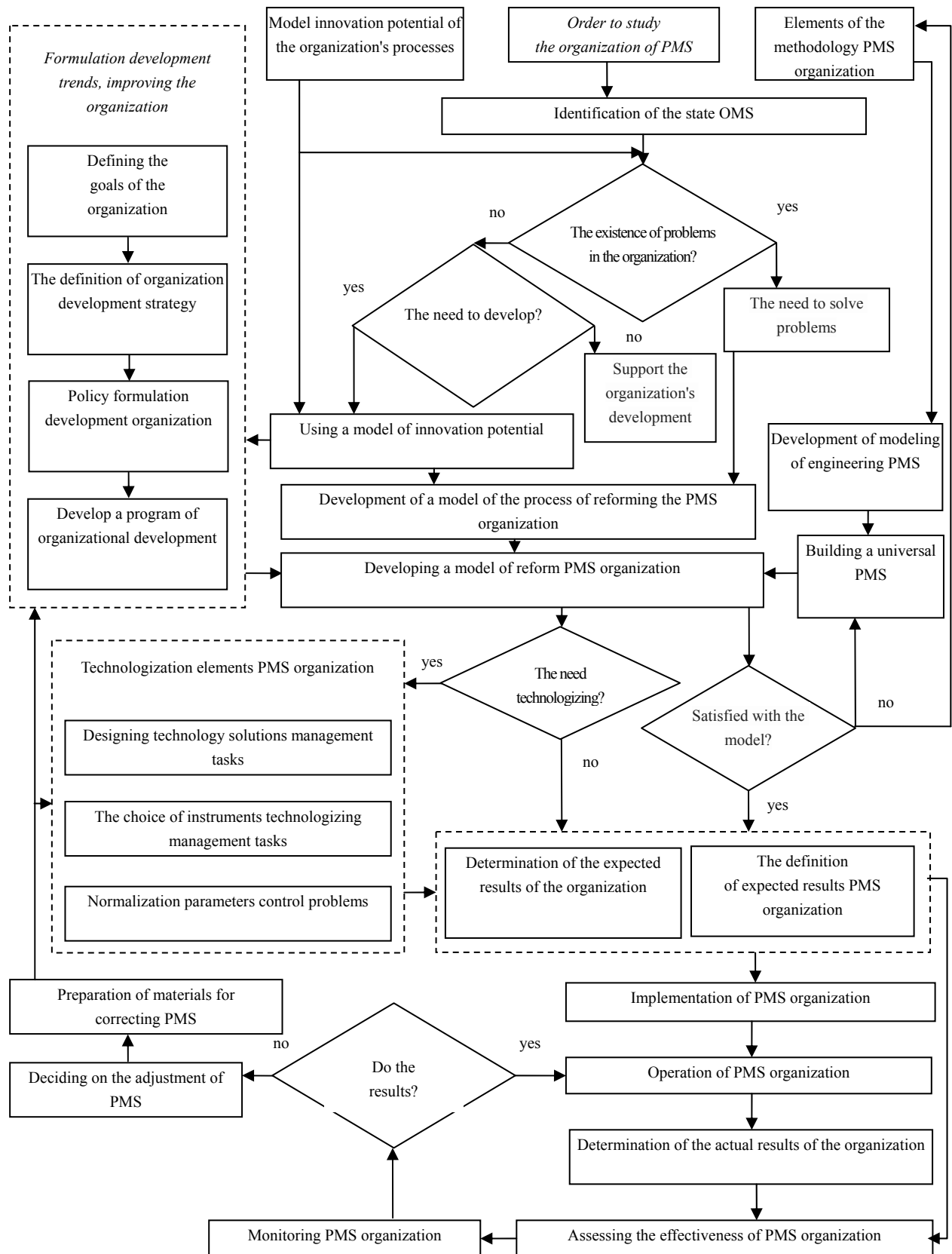


Figure 2. Model of development Process Management System

Competent employees move step by step to consider all the previous stages of the model to determine the adequacy of the process of PMS development, as well as the measures on introduction of new elements in the organizational processes. If the experts cannot present the convincing reasons in favor of the provided options of OMS development based on introduction of new management sub-processes and FMT, it is advisable to go back to the step “Building a universal PMS” or revise the elements of the methodology of PMS development, and design the PMS according to the suggestions of the experts.

Nowadays, the new approaches to management are being developed. One of such approaches is the technologizing of management processes. At the present stage, it seems to be the most effective to use the management technology, which includes mathematical, logical, and sociological tools and techniques (Harrington, 1991). The need for technologizing is recognized gradually, when the organization is faced with the need to streamline its administrative and operational processes. Currently, there are practically no standard models to form and develop these activities.

The decision on technologizing the organization management processes may be caused by the need to define particular administrative tasks clearly, assign them to particular task owners, and standardize the procedures to fulfill them. Process technology ensures fulfilment of the requirement that the same type of procedures should be performed in the same way when fulfilling various FMT. It is also important, when selecting the range of means, to ensure fulfilment of FMT (Harrington, 1991). In addition, the FMT technologizing promotes interoperability of specialists within the organization.

The main focus of management decisions at the highest level is to define the basic objects of technologizing in the organization and to designate the persons, responsible for this area of the project activity.

Since the PMS reforming for OMS development is to be carried out at the level of FMT, the parameters of tasks are distributed according to standards. This is necessary in order to determine the number and qualifications of specialists in carrying out various activities in the area of management, in particular, standard time periods for accomplishing FMT.

The process of developing and implementing the standard time periods for accomplishing FMT includes calculation, discussion, revision and approval. This is a long process, but it can be shortened due to open publication of all materials, both the input data for the calculation and the standard time periods. The standards of prototypes or similar FMT used at the leading enterprises of the country can play an important role in this process (Kaufmann & Henry-Labordere, 1977).

The elaboration of tools of PMS development in the organization is achieved through implementation means, due to which the desired result is obtained. These means include the methods of performing procedures, management elements, managerial decision-making methods, and various types of support (informational, legal, technical, personnel).

After the introduction of new PMS elements, the actual operational results of the organization may not satisfy its management. In this case, the mechanism of PMS elaboration can be upgraded. This may be due to the omission of some procedures or their unsatisfactory performance (Kaufmann & Henry-Labordere, 1977).

## 5. Conclusion

Using process and functional approaches involves the possibility of inclusion of original elements or new technological operations, which should greatly enrich this work and introduce additional space for research and development. This may be found necessary when designing systems, processes, or parts thereof, and when designing some new operations which may become necessary in some process (Gerasimov, 2014).

The proposed models and techniques have been applied to the reform of a number of organizations.

The elaborated models and OMS development techniques based on reengineering allow structuring the elements of management processes, increase the responsibility for management tasks, and establish the rules for their performance, which ultimately increases the productivity and quality of the activities of managers. This allows us to recommend applying the mentioned methods and techniques to a wide range of economic systems, especially the large organizations, using a large variety of management functions of its activities.

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