

Mechanical Implementation Of Business Process Reengineering

Marga Živitere ^a, Viktoriia Riashchenko
ISMA University of Applied Sciences
Lomonosova str. 1, k.6, Riga, Latvia

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Abstract. The purpose of this paper is targeted, systemic understanding of the need to introduce reengineering of business processes at the most modern factories depending on the requirements of the environment, since it is business processes which are, ultimately, subjects of any innovations. It employs the object-oriented approach that allows us to describe both data of the essence of the process and its behaviour provides a transparent, easily modifiable business models that allow the recycling of individual components. Reengineering process provides the maximum improvement, nevertheless, it remains time-consuming and the most expensive of all approaches meant to improve business processes and it is also related to the greatest degree of risk. This approach can be applied both at the level of an individual process and at the level of an entire organization. This paper outlines a range of possible measures for implementation reengineering of business process, its adaptation to minimize the cost and time, improving the competitiveness of a business entity by creating a comprehensive framework for organizational design.

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Introduction

The choice of a control method is dictated by the requirements of the times - each epoch was characterized by its methods - and realized by the head of the firm based on his/her perceptions and beliefs.

Business reengineering, as well as many other methods of management, came to us from the West. There, during 80 years it has become a widespread method of the revolutionary transformation of the company, a radical restructuring of its business, which was called “reengineering”. Its ideologues - M. Hammer and J. Champy - expressed the essence of reengineering in the following words: “This is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvement in critical areas of their performance - price, service, quality, pace” [1].

One of the key concepts that underlie the re-engineering of business processes is that their improvement is a huge reserve for increasing the efficiency of the enterprise. And for this it is necessary to comprehend the nature of business processes, to understand what value they have for the enterprise, how they should be properly modified.

Needless attention to business processes, improvement of

them demanded managers of a non-standard approach. Gradual re-engineering, which offers the company to break the existing system and build it anew on the basis of a revolutionary change in business processes, became transformed into the control system, “cluttered” technology in order to stand on the ground of scientific justification. Relevant software products began to appear. Business reengineering of paramount process approach appeared, where the object of control is the processes in the enterprise [2].

This article will consider the application of the methodology of business process reengineering, which, in our view, improves the consistency of procedures, methods and instrumentation support for management and its adaptation.

This necessitates the transition from task management to the management processes. In such an organization result of the work will be visible to each participant of the process as a “client” of the study results to determine the original and, therefore, the result is predetermined, based on customer expectations [3]. From the perspective of the process approach, the organization appears as a set of processes (with a functional approach - a set of functions). Management now becomes the management processes. Each process thus has its purpose, which is a measure of its effectiveness - how the

^aCorresponding author, email: marga@isma.lv

process leads to its achievement in the best possible way.

The objective of all the processes of the lower level can be achieved through the implementation of top-level goals. That is the lower-level-purpose as a part of the higher-level goals. The relationship of these goals plays an important role in the process of reengineering. By managing processes and continuously improving them, the company achieves high efficiency of its operations [2]. Consequently, the basic focus is on processes, as they permeate all elements of management and focus on building the necessary processes and managing them.

Re-engineering of business processes has been widely discussed in theoretical papers, textbooks and practical manuals, which nevertheless does not give an answer to the question of how to properly implement a reengineering project. Even if the project was designed by consultants, we must remember that, according to various estimates, the percentage of failures of reengineering projects in Western companies is 70%. There are many examples that developed projects were not implemented [4]. The reason for this, from our point of view is the rejection of other approaches to the management of the organization, the formal implementation of the principles of reengineering.

The forerunner of the process approach was the functional approach. Now it is already outdated, and there is a modern alternative to the process approach as a tool of reengineering. But the rejection of the functional approach requires removing the concept of “function” and therefore “functional principle of the creation of organizational structure”. Then only process structure is built up. It turns out that the distribution of specialists will be on the basis of their belonging to the processes. The company, as a rule, is each member of the multifunctional type [2].

Therefore, it is the combination of functional and process approach to company management, usually the “golden mean”. Functional structure of the company defines “what to do”, but the process defines “how to do”. These are two inseparable sides of management. If a manager, the head of the firm is able to look at the organization from this point of view, reengineering will be a really useful and effective tool for managing [2].

Business process reengineering is a comprehensive method that allows you to set the company strategic goals and objectives by optimizing the performance of all divisions of its functions and operations. Therefore, its application to optimize business processes is in line with the strategy of the company to provide transparency for business owners and senior managers, to effectively manage operating activities, to make processes predictable, formalized processes for later automation.

Practical activities to manage and improve business processes by using the technology of business reengineering, implement the following possibilities described in several Refs. [5-7]:

- 1) creation (design) of future business processes;
- 2) diagnostics of business process management;
- 3) change (adaptation) of business processes;
- 4) business process optimization;
- 5) documenting business processes.

1. Creation (design) of future business processes

For this purpose, a special language for describing business processes is used. It allows us to describe the current state of business processes and create models for the future. The model includes a description of all components of the process - the functions, resources, participants, objectives, information, results, events, the direction and sequence of actions - thus reflecting the current reality or representation about it in the future. All the actors perform their responsibilities in accordance with this model. Each staff member clearly knows all their actions through all the processes in which they are involved [2].

In describing the business processes as a rule the method SPA (Structured Process Analysis) [8] was used. The SPA method does not discard the possibility of description using various schemes of algorithms. SPA allows to describe the processes in detail and also allows to operate at a level that is necessary for current business process reengineering [13].

The description of a multilevel structure (which first describes the process at the macro level, at the enterprise level, and then goes on to describe the lower level with a higher degree of detail) provides a systematic, structural interconnectedness. Actions of all departments and staff performing their duties in accordance with such a model must be adapted, coordinated and directed into the channel of the overall process to achieve system-wide result [2]. Systematic implementation of a business process requires coordinated efforts of all the subjects of management, which confirms the words of an American scholar M. Mesarovich [10]: “The system needs to be designed as an integer, rather than start with the process and then just add the necessary control. One can cite examples in which the design process technology takes into account the presence of control sub-systems, but system-wide approach, without separation, is still not implemented”.

Process management system is as much necessary to form a process structure, that is, arrange them in a particular, interconnected manner. Since each process is designed to produce a result, which is further used to obtain further results at later stages and higher levels, this structure must provide, ultimately, the overall objectives of the company. It is them that process improvement is the most effective way to achieve [2]. In this case, today it is unlikely that many understand the urgency and necessity of maintaining the integrity structured around an object, activity. The second point, which prevents the achievement of high performance analytic business process management, is a multipurpose, variegated direction, and the subjects of the head. As a result, it seems

there seems to be a lack of "professional" integrity, both in the understanding of the analyst and the manager [11].

First of all, this is due to the standards that are used when describing the business process management to link schema of the current operating performance to that of managers, analysts, etc. The organization is described as a combination of structural units and positions, rather than as a single "organism", and based on the possibility of applying a process approach. As a consequence, an incorrect statement of the problem description and the inefficient use of the models themselves arose. In the best case, the simulation of the head is limited to a single function with multiple inputs and outputs that do not help in overcoming the difficulties in achieving integrity [12].

Creation (design) business process involves the following:

- i) development of an image of the future organization and
- ii) development of the business model of the new organization [13].

2.1 Develop an image of the organization

A promising way to develop the organization should be performed using a comprehensive approach based on a combination of strategy development process and requirements for the business. The composition of the first stage includes specification of the main goals of the organization based on its strategy, customer needs, the overall level of business in the industry and the current state of the organization. The purpose of this stage is to develop a view of the new organization and formulate it in terms of specification of goals of the organization.

2.2. Develop business models

In recent years, a four-stage process of model building is widely used to redesign processes or the development of a "new" organization. The four phases are presented below.

1. Development of an external model of the future organization.
2. Development of an internal model of the future organization.
3. Creating an information system to support future business processes.
4. Testing the redesigned business process on a small scale before implementing it.

Modelling of processes is carried out with the obligatory use of a modelling language. The modelling language must be expressed as an internal or external process is realized by means of human or technical resources, and from what functions these resources will be taken. It is particularly important to show how the process could be supported in information system.

Information technology now in principle performs a powerful "locomotive" of change that sets in motion all the

other parts of the organization. The change of business environment to the enterprise faces not only new operational issues, but there are new strategic development tasks which require new information and new quality, which reflects not only the state but also the very structure of the business. The information systems reflect the latest technical advances and expertise in the subject areas of management. The information system integrates all business units, it will automate many functions of collecting and processing information [12]. The main condition that must be fulfilled with the new information system is the flexibility and ease of modification, monitoring changes in the business [9].

According to Popov, Robson, Subanova and Filinov, with the help of information technology one can achieve the various categories of changes that can improve not only the temporal characteristics of processes, but also reorganize the sequence of steps in carrying out operations in business processes, control parameters in certain cases. Information systems permit unification and acceleration of the diagnosis of business processes [7-8, 14-15].

2. Diagnostics business process management

Process model (existing or projected), due to clarity of description, enables the effective analysis of how it will lead to the goal in the best possible way. Analysed factors may act a logistics process, its duration and cost (including distribution of them in stages). In other words, it may affect the efficiency of execution. Data analyses enable you to change the process, constantly improving its quality [2].

Quantitative indicators of the processes demonstrate the effectiveness of their controls in a certain stage of development of the organization. Resources are managed processes, and they also transform resources into finished products, which can quantitatively evaluate the effectiveness of management processes. Quantitative indicators of process management include: the complexity of processes; causal relationships between processes, control of processes, resource consumption processes, the degree of controllability of the processes [13].

Business process analysis is conducted to develop proposals in order to address the problem areas in the processes of the organization.

For this there is a "snapshot" of technology performance processes - a model of business processes "as it is", which allows the customer to obtain a comprehensive picture of what's happening in the company. In the analysis, the model identifies current problems of business processes: double subordination, duplication of functions, lack of data communication between processes, inconsistency of processes. According to the analysis, a proposal puts forward a direction of change (adaptation) of business processes.

3. Change (adaptation) of business processes

Any changes to the business environment - the emergence of new activity, diversification, changes in the supply chain, technology - all require an immediate transformation of the affected business processes. The existing model is adjusted, the changes are communicated to the performers, and they begin to act in accordance with new conditions. A continuous adaptation of business processes to changing conditions is an effective mechanism for business management [2].

Implementation of changes is the most complex and critical phase of reengineering. To minimize the risks associated primarily with resistance to the internal environment, a detailed and consistent work with staff must be done; staff at all levels are involved in the process of change and are motivated to achieve its results, i.e. to optimize the work and flexibility of an organization. For this purpose it is necessary to check staff compliance with the new job responsibilities, to determine the need and quality of qualified personnel; employees adapt to new job requirements and verify the correctness of the implementation of the new rules.

The result of this stage is not only the immediate implementation of all changes, but also that employees are trained to the new style of work - dynamic and therefore competitive. The company enters a new level of organization of work. The main result of the introduction of changes is that the company laid the mechanism of re-engineering - the continuous change and adaptability to environmental conditions. Organization receives an additional competitive advantage in the marketplace, the ability to optimize business processes in order to develop a new business model.

4. Business Process Optimization

In order to determine reserves for increasing organizational effectiveness and optimize business processes, also to monitor and analyse business processes, the company has to eliminate the following factors: the duplication of functions, "bottlenecks", excessive cost and availability of redundant operations, as well as poor quality of their execution, lack of coordination between the participants, etc. Optimization can be of two types - continuous improvement processes (evolutionary distances) and the periodic radical change (Revolutionary Path). The first method is used in the ongoing activity when an enterprise does not need drastic changes. The second way is used when the necessary changes in connection with a major change are necessary in the order of activities, such as integrated automation. In such cases, the task like "start from scratch" is implemented. This approach avoids the use of old processes of new technologies.

There is a need to fix the existing business processes in order to assess their effectiveness. If you do not do it today, then in the future there can be significant costs associated with inefficient staff performance, breach of contractual ob-

ligations, the need for restructuring, etc. This entails considerable financial costs and the loss of company's image [16].

The company has to see the bottlenecks in the activities and effectively manage an organization to link the performance of certain processes, work with its target strategic ones. A comparison of strategic goals and objectives of the company have to be in line with input and output processes. Company's performance depends on its results and processes. In accordance with the dependence of selected indicators, this will involve management. As a result, the organization at all levels is aimed at achieving results, and company owners and managers with an objective mechanism have to assess results of its operations and activities in the organization.

Further, the results of the analysis of business processes should be modified: from the model "as it is" to form a process model "as it should be".

During the optimization, the following procedures could be defined.

1. Elaborate proposals for the optimization of business processes are put forward (functions are redistributed between actors, duplication of functions is avoided, the information gaps between the blocks are bridged, optimize workflow system between the structural units is involved in each process).
2. Together with employees the company develops the scheme of information flows to streamline business processes, lists incoming and outgoing structural units of information: the type of outgoing documents, the recipient, responsible for implementing and approving the document's official terms of delivery.
3. Regulation scheme of the movement of documents, development (optimization) of the document management (regulation) on the basic building block of every business process with an indication of participants (including liability), the timing and form of information transmitted within each business process are all carried out.
4. Recommendations for optimizing the organizational structure of the customer company are made, taking into account the optimized management system (optimized business processes).

The result of optimization is the models of business processes "as it should be", subject to their optimization and service pack (newly designed), internal normative documents (regulations about departments, job descriptions, regulations of the execution process).

5. Documenting business processes

All actions and changes in the management of business processes need to be reflected in the documentation. Business process models created in the form of declarations is a diagram on paper and electronic media. All this together is a repository of business processes. Any changes required

are reflected in the models of the enterprise so that it could always keep the latest version of the complex business processes. Similarly, we can plan future processes and save them as versions that are analysed, tested and debugged, and only then become working [2]. Planning organizational change includes analytical and forecasting activities, the development of measures and selection of an appropriate strategy. Different levels of intervention into the old structure (individual, group, department, organization as a whole) should be taken into account, as well as numerous institutional settings, including the following [17]:

- i) the structure and processes (in recent years they have increased in the direction of “smoothing” the hierarchy and a strict focus on the process of creating wealth in the “horizontal organization”);
- ii) production and information technologies (e.g. the introduction of the minimized production of resources);
- iii) organizational culture as a model of fundamental values and principles shared by members of the organization (a fundamental change in them is extremely difficult);
- iv) human resources, for example, selection, staff development, incentive and motivation (with the “transformation” of behaviour and attitudes) by the HR management.

It is crucial to distinguish between partial and radical change. The first is based on the existing systems of values, structures and processes. The partial transformation is dominated by the practical usefulness of the project, rather than absolute achievement of the ideal (conceptual) state. Radical changes are necessary due to the rapid development of the surrounding market environment after a long phase of stability and long-term neglect of necessary adaptation steps. So “revolutionary” change process in order to achieve the advantages relative to competitors may be strategically desirable, but meet strong resistance from staff [17].

Consequently, we can say reengineering is the methods used in specific periods of development of an organization, when you need to make a qualitative change in the organiza-

tion in a radical way and with sharp abrupt transition into a new state, missing up to this point of development. The need to adjust the management system may be due to:

- 1) feedback, i.e. the influence of results of the control object (in particular, the discrepancy between normative and actual parameters of the object);
- 2) the need to revise the objectives, practices and processes implemented by management system;
- 3) the development of software and technological tools as well as innovative management techniques [18].

Conclusion

According to the literature analysis, it is possible to point out that singularity of business process reengineering management lies in the following statements.

1. Reengineering helps to transfer management of the organization with the functional principle to the principles of process organization, which are characterized by a process of management structure, process teams, focused task-specific business process.
2. Reengineering approach frees up additional resources (financial, human, technical, etc.) and invest them in the main proceedings.
3. Reengineering approach focuses on the growth of investment activity and creates the prerequisites for the growth of innovation activity. The orientation of the process determines singularity of reengineering: the creation of new technologies, technical means of production and, consequently, encouraging innovation, technological progress.

Applying re-engineering of business processes will improve the consistency of procedures, techniques and tool support for management, its adaptation to minimize the cost and time. In other words, controlling the process, we will organize an effective interaction both internally and externally - with the outside world. Accordingly, it reduces transaction costs (the costs of poor interaction) - both internal (employees and divisions among themselves) and external (the company with customers, suppliers, investors, etc.).

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