Optimization Methods Influence Scheme on the Dimensions of the Sub-processes

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Abstract: **This research present schematic diagram which shows the influence of the processes optimization methods towards the four most often used dimensions of the processes through the aspects of optimization of the business processes. For this purpose the four most often used in practice dimensions of the processes and the four aspects of business processes optimization must be described. As the result the scheme of influence of the improvement methods on the dimensions of the sub-processes is developed.**

Keywords: **business process, sub-process optimization, improvement tools, analysis of influence**

I. INTRODUCTION

Each organization is striving to enhance its competitiveness and to increase its revenues (Gaitanides, 2004). On the other hand it functions through carrying out transformation of raw materials into a product/service. The very transformation of the inputs is done through the running of various business processes (Harmon, 2007), processes (Deckler, 2003; Harmon, 2007; Haist, 2001; Harrington, 1991; Ould, 2006; Lowenthal, 2003; Süssenguth, 1992) and activities (McDonald, 2010; Portougal, 2006). As a result of the running of all these activities, processes and business processes united in production cycles, value is added (Harrington, 1991). It is a continuous process, which most often leads to modification not only of the production, but also in the management structure. The optimization should be in compliance with the selected strategy and the company structure. Further, the business processes improvement should take into consideration the following aspects: "flexibility" – showing the possibility of the managing bodies to take decisions related to the strategic reorientation or revision of the goals in accordance with the changes in the environment; "wholeness" – the existing and potential relations and interactions among all activities, processes and business processes in the organization to be used in order to achieve the specified common goal; and, "strategic range" – all events related to the business process optimization have to be in conformity with the company strategy.

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In order to perform the optimization of the critical business processes in the organization, it is necessary the overall need of optimization of the entire business process and the necessity and priority of improvement of the sub-processes, which build them, to be identified. One of the options is to identify them by presenting the processes as vectors – real and target ones. Their building can be reviewed as a preparatory stage of the business processes optimization. The real vector represents an aggregate of all activities and sub-processes building the business process (Brüggemann, 1998). Each activity, sub-process or process is presented as a partial vector with the relevant coordinates. The coordinates describe the real (target) values of the parameters characterizing the various aspects of the process effectiveness (Papula, 2001). By summing up the vectors, the common (resultant) vector is obtained. The target vector has been built by marking the coordinates of the target on the coordinate system, which dimensions are determined by the parameters monitored by the early warning system (Bedenik, 2012). From the zero point of the coordinate system to the point marking the desired improvement the target vector was constructed. Then it proceeds with performing a comparison between the coordinates of the two vectors. This allows for determination the necessity of improvement of each business process and establishing the need and the priority of improvement of each sub-process building the business process. Finally, the actual reorganization of the existing sub-processes or activities is done. Proceeding from the vector presentation of the processes, the deriving of the optimization methods is based on the following principles: translocation of vectors; change of vectors' lengths/sizes; addition of a vector; elimination of a vector. On the grounds of those principles, ten methods have been elaborated for the performance of improvements in the business processes. Each tool is based on one or a combination of the aforementioned four principles.

✓ Acceleration – shortening the duration of one or several sub-processes;

✓ Delay – the running time of a sub-process is prolonged;

✓ Parallelizing – the critical sub-process is divided and the newly formed sub-processes are performed in parallel;

✓ Automation – isolated case of the acceleration method;

✓ Unification – integration of two or more existing sub-processes in one new one;

✓ Changing the succession – changing the succession of the sub-processes in view of smoother running of the process chain;

✓ Adding – integration of an entirely new element in the existing process structure;

✓ Insourcing – adding an element, which by this moment has been outside the company borders;

✓ Elimination – elimination of one or several sub-processes from the integral business process;

✓ Outsourcing – assigning a company sub-process for performance by an external organization.

The goal of the present research is to analyze and present the scheme of influence of the optimization methods impact on the processes.

II. ANALYSIS OF THE INFLUENCE OF THE METHODS FOR IMPROVEMENT ON THE SUB-PROCESSES DIMENSIONS

In order to analyze the influence of the improvement methods on the dimensions of the sub-processes, it is necessary a scheme of the influence to be elaborate. To that end it is necessary firstly the dimensions of the processes and the aspects of business processes optimization to be described.

Dimensions of sub-processes

Various characteristics are used as dimensions for the performance of analysis and optimization of the processes (sub-processes) building the business process. They are determined in accordance with the information generated by the early warning system. The characteristics are divided into maximizing and minimizing at the preparatory stage of the optimization. Maximizing are the ones, the values of which should be increased as a result of the improvement, and minimizing are the ones, the values of which should be reduced. In general, the dimensions needed to achieve results from the running of the process can be divided into four categories: "quantity", "quality" (maximizing dimensions), and "costs", "time" (minimizing dimensions). The differentiation of the parameters should be in conformity with the strategic goals of the organization. Because of that reason, the characteristics describing each process can be different for the individual business units.

The quantity of manufactured products is one of the most often used characteristics of the processes. The main reason thereof is the fact that the quantity of articles produced in fact reveals the result of the running of the process and, hence, its efficiency.

Quality is a specific characteristic as of the processes, as well as of the products resulting from their performance. There is no universal measuring unit for quality. Widely accepted is the quality to be measured

through features and characteristics, which satisfy the customers' needs. In the modern practice various concepts of quality management and improvement are applied. The most famous and widely applied are "the systems of total quality management (TQM)", the "Six-Sigma Approach", as well as quality standards (ISO 9000).

The costs are one of the basic measuring units in the contemporary business environment. Due to that fact, they are also used as characteristics of the processes. Through them it is determined actually the extent of efficiency of the operation of the process chain in general and, in particular, of the individual sub-processes or activities.

Another important measuring unit for the efficiency of the sub-processes is the time of their running and manufacturing of the product/service ordered by the customer. The shorter the duration of the process, the sooner the customer's need shall be satisfied. That way one wins the loyalty of the buyers and the result is increase of the company's revenues.

In order to determine the extent of the influence of the proposed tools on the dimensions of the processes, it is necessary the aspects of business processes improvement to be used. Through them the identification of the exact logical and quantitative interrelations between the methods and the dimensions of the processes is facilitated.

Aspects of business processes improvement

The business processes optimization is most often performed in four main directions – spatial, quantitative, logical and time optimization. They can be presented as summarized categories of criteria, through which one can assess the influence of the methods of optimization over the business processes.

The spatial optimization is directed towards improvement of the spatial dislocation of the separate process elements. The increase of the number of units, in which the factual performance of the separate elements of the processes, sub-processes and activities is carried out, leads to artificial increase of the unwanted relationships. They, on their part, increase the potential of occurrence of problems related to extension of the time, increase of costs, even decrease of the product's quality.

A basic feature of the quantitative optimization of the business processes is the elimination of their inefficient components. It is expressed as in the physical elimination of sub-processes or activities from the business process structure, as well as spatial configuration of a process outside the company borders – "outsourcing of processes". This is done for the purpose of elimination of repeating or non-adding value components. "Outsourcing of processes" is applied upon the availability of a more efficient external

supplier of the product or service produced in the organization by this moment.

The logical optimization is related to the change of the succession of the sub-processes and the activities within the business process. Modification of the arrangement of its separate elements is done according to the order of their performance (Angelov, 2008). As a consequence of that modification, the time of performance of the process chain is shortened, the productivity is increased and the synergic potential is used.

The essence of the time optimization of the business processes is the shortening or the extension of the running time of one or several sub-processes. The underlying concept of this improvement aspect is that the speed of each business process depends on the speed of the most slowly running component, which builds it.

It is necessary to mention also that there exist causal relationships between the various aspects. They are presented on Figure 1. For instance, the change of the number of factual locations of sub-processes performance, as well as the elimination of one or more of them, leads to improvement of the logical structure of the business process. On the other hand, the logical optimization can change the spatial dislocation of the sub-processes and to shorten the running time of the business process. In turn, the time optimization affects: the logical succession of running of the sub-processes and activities; the number of the process elements existing within the organization, as well as their spatial dislocation. The application of the quantitative optimization shortens the running time of the business process and at the same time leads to decrease of the unwanted relationships between the processes.
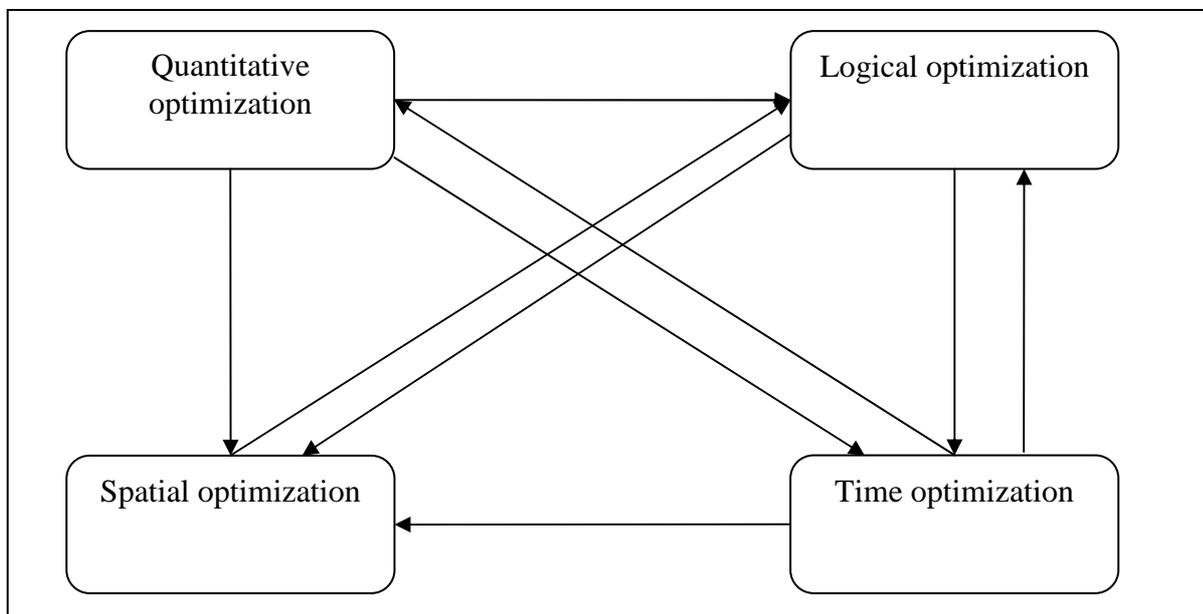

Figure 1. Causal relationship between the aspects of business process improvement

III. DEVELOP A SCHEME OF INFLUENCE OF THE OPTIMIZATION METHODS ON THE DIMENSIONS OF THE SUB-PROCESSES

First of all it is necessary to mention that each method may be applied on one or several sub-processes within the business process, as well as that one or several methods of optimization can be applied on one sub-process. This way, the number of possible variants of performing the business process reorganization by the mentioned methods is increased time and again. The number of simulations of process chain running also grows and all that leads to increase of the expenses for the organization. In the conditions of limitedness of resources, in which the companies are functioning,

striving exists for continuous reduction of such kind of expenses. This could be achieved through assessment of the existing relationships between the optimization methods and the categories of assessment criteria for the business processes and also between the categories of assessment criteria and the dimensions of the separate sub-processes. Besides, in some cases, mentioned most often used in the practice dimensions are dependent from one another. The degree, with which they compensate among them, is specified in a previous stage of the optimization process. The improvement of one may not be achieved by worsening the indexes of the other dimensions. A balance must be sought between all parameters describing the processes. On the other hand, between the categories of criteria for business processes assessment and the exemplary

features describing the processes and the sub-processes certain quantitative dependencies also exist. In addition, the proposed methods of optimization in turn affect the achievement of optimum conditions in the four main directions of performing the optimization of the

business processes (Figure 2). The influence of each of the specified methods of optimization on the mentioned dimensions of processes is ascertained and assessed through an expert's assessment.
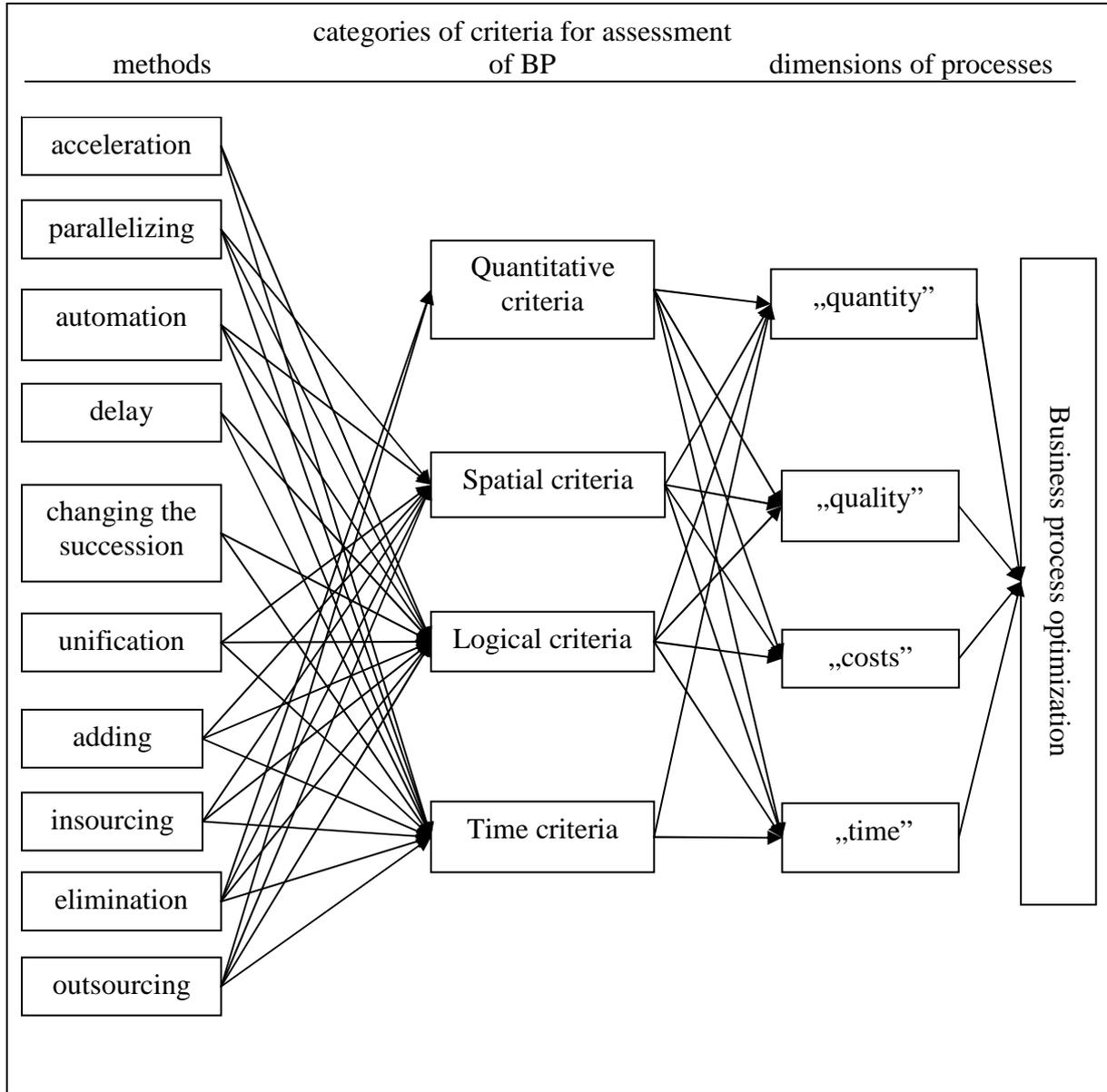

Figure 2. Schematic diagram of the methods influence on the dimensions of processes

IV. CONCLUSION

In this study a scheme, through which it can determine the influence of each of the ten optimization methods on the four main dimensions of the sub-processes is presented.

The development of a scheme of the influence of the improvement methods on the dimensions of the processes helps to reduce the number of simulations and

the costs related thereto. Thus, on the one hand, the achievement of optimal business processes is guaranteed, and on the other hand, upon availability of data on the exact size of the deviation of each business process dimension from the target, the choice of the kind and number of methods and the number of sub-processes to be applied thereto shall be facilitated. Another positive effect of the presented methodology is related to the simplification of the simulation method

itself, the reduction of the simulation procedures number, reducing that way also the alternatives. In such manner, it can gain savings and support to the decision making process at strategic and operating levels.

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