

Review paper

DESIGN AND IMPLEMENTATION OF BUSINESS PROCESS PERFORMANCE MEASUREMENT SYSTEM

UDC 65.015.25

Ernad Kahrović

State University of Novi Pazar, Department of Economic Sciences, Serbia

Abstract. *The management of modern companies includes the application of the process approach. Process approach in management is necessary since it provides a new perspective to the company's management in terms of identifying problematic, inefficient processes and activities that have a negative impact on the overall efficiency and competitive position of the company. Such business management which includes adoption and implementation of the process approach requires consideration of the issues related to designing a business processes performance measurement system as a key control and management instrument. Those companies that have not implemented process approach to management in the past, but, however, choose to implement this approach because they are faced with a fierce competition, need to set up a process performance measurement system. Therefore, the aim of this paper is to shed light on the key moments in the design and implementation of the performance measurement systems in a process-oriented company. In order to look at the above mentioned issues, the paper is organized as follows. The first section of the paper discusses the characteristics of the process orientation and classification of business processes in a process-oriented company. A conceptual framework of business process performance is developed in the following section. This is necessary in order to determine the concept of business processes performance measurement, as well as business process performance dimensions. Setting up the conceptual framework for business process performances and their measurement is a basis for analyzing the so-called strategic approach to the selection of the indicators of the business process performance and setting up (designing) business process performance measurement systems in a process-oriented company. At the end of the paper, the attention is given to the important moments and stages in developing a system to measure the performance characteristics of the business processes in a process-oriented company.*

Key Words: *business processes, measurement, performances.*

Received April 17, 2013 / Accepted October 04, 2013

Corresponding author: Ernad Kahrović

State University of Novi Pazar, Vuka Karadzica bb, 36300 Novi Pazar, Serbia

E-mail: ekahrovic@np.ac.rs

INTRODUCTION

In the knowledge economy era, the key resources for gaining a sustainable competitive advantage are of immaterial, intangible, or intellectual. In a modern business environment, the mission and strategic goals of a company cannot be realized without adequate creation, combination and application of knowledge and other intangible resources. Furthermore, the importance of intellectual capital for the successful performance of the company and the increase of its market value is generally acknowledged. Intellectual capital, in the information age, is the key factor in maintaining and improving competitive advantage (Krstić, 2009). Trends related to creating value for the shareholders and maintaining competitive position are changing. Namely, the competitive struggle between market rivals in the knowledge economy differs significantly in several aspects from business operations and market competition between companies in the industrial age.

First, the successful management in the global business environment, among other things, implies networking of an enterprise with its customers, employees, suppliers, strategic partners and the community. Second, one of the vital market factors that distinguishes one enterprise from other market participants is the quality of services provided to consumers. Third, the key to business success of each enterprise in the "new economy" is the capability to predict the market discontinuities and respond to new trends and changes in technology in a particular industry. Therefore, the requirements to make changes in the manner in which one company competes with other firms, to constantly innovate, to increase flexibility and improve the skills and competencies within this company are always present. Fourth, the appropriate application of modern technologies can significantly contribute to improving the competitiveness of enterprises. Fifth, the change in orientation from the vertical orientation and functionally oriented management to the process oriented one, i.e. to the horizontal organization and process-oriented management is also relevant. This orientation determines the management of a series of interrelated business processes, which actually makes the particular business process the key management issue. Business process management represents a condition *sine qua non* for efficient management of modern enterprises (Novičević, 2012, p. 227; Novičević, 2010). Process orientation emphasizes the position that the business performance of the company can be improved based on the analysis, monitoring and improving the performances that make a set of business processes, again, through the implementation of which the functioning of an enterprise is realized.

1. CHARACTERISTICS OF PROCESS ORIENTATION IN MODERN ENTERPRISE MANAGEMENT

Due to the numerous benefits regarding the efficiency and competitiveness, the dominant trend in many companies in the last two decades has been that of the transformation to the process orientation and process-oriented management. The main characteristic of the process-oriented management is a process as an object of control, and its main goal is the improvement of the business processes performances (Sekulic, Krstic, 2005). A process-oriented company is set up by transforming traditional (functional) structure to the new process structure, i.e. the organizational units responsible for particular functions are based on business processes rather than business functions (departments). This means that jobs are not grouped according to similarities in functional units, as is the case with a functional organizational design, but according to their connection with the specific pro-

cess. A company with a hierarchical system of functional units, through transformation towards process orientation, becomes "flatter", with fewer levels of management, while autonomous process teams perform particular activities within business processes from their beginning to their end (Krstić, Jovanović, Kahrović, 2012).

Dynamic competitive conditions gradually reduce the significance of the classical, functional models of organizational structuring, because they are based on a vertical, hierarchical organization that has shown a number of limitations that reduce the effectiveness of both organizational and business units. Therefore, companies need to eliminate deficiencies of the functional organization and vertically oriented management (Becker, Kugeler, Rosemann, 2003, p. 2)

Process orientation has introduced innovations to the business performance management system of a modern enterprise. In addition to management at the enterprise, business unit or organizational unit (functional department) level, yet another level of performance management is created – that of process performance management. Bearing in mind that the processes are made up of activities, the activity management concepts should be considered (Activity based budgeting, Activity-based costing, Activity-based management, and so forth). Namely, the efficient management of modern enterprise in contemporary conditions requires the company's management not only to focus on performance management of business functions (departments) as organizational units, as well as on the performance management of business units (divisions), but also to look at the operations of the enterprise or its business units from the aspect of business processes. Therefore, it is necessary to plan, measure, analyze and improve the performance of business processes, as well as the activities that constitute them. Process approach to management makes it possible to better identify the causes and factors of enterprise functioning in relation to the classical concept of enterprise management, i.e. the functional organizational design. The process approach is a tool that allows a more profound, more precise, new look at the essence of the company's operations and the causes and factors of its business performance.

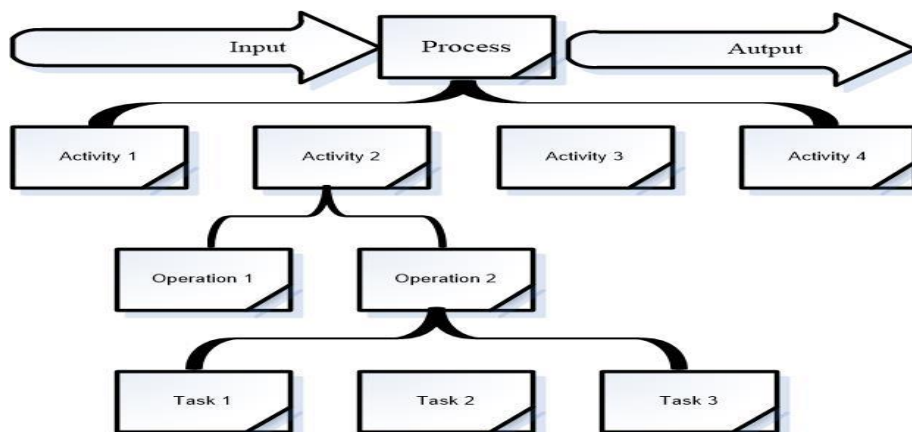


Fig. 1 Process disaggregation

(adapted according to: Jacka J. M., Keller P. J., 2004, p. 22)

The implementation of the process orientation allows the company to increase its management quality and economic efficiency (Krstić, 2000). The implementation of process orientation makes it possible to identify variations in terms of time, quality of realization and the outputs of the activities within the business process, with the aim of increasing the efficiency of business processes in enterprises (Krstić, Andjelkovic-Pesić, Andjelković, 2010). A business process is a precisely determined sequence of activities, with its beginning and its end, with clearly identified process inputs and outputs, which are necessary for satisfying the needs of both internal and external consumers (customers) for products or services of appropriate quality and cost and in a timely manner, while at the same time creating value for consumers (Bosilj-Vuksić, Kovacić, 2004, p. 32). A business process consists of (Jack JM, Keller PJ, 2004) the following: a) *activities* b) *operations within each activity*, c) *tasks within operations* (Figure 1).

For the purpose of the efficient planning, measuring, analyzing and improving the performances of business processes, it is very important to identify the *structural, operational and limiting characteristics of these processes* (Krstić, Sekulić, 2013, p. 415,417).

The first structural process characteristic is a *business process hierarchy* (Harrington, 2006, p. 2). It is a capability of disaggregation of a certain process to its lower hierarchical elements - activities, operations, and tasks. The second characteristic is a *network of interrelated business processes in an enterprise*. This network provides the basis for allocating resources which makes it possible to meet specific process realization requirements (Janković-Milić, Krstić, 2002, p. 150). The third characteristic is the mapping of business processes as a graphical representation of the process and activities implementation flows. Furthermore, the benefits of mapping the values of business process flows are numerous and highly significant (Novicević, 2011, p. 253). The fourth characteristic is *the chains (flows) of the business process value*. This stresses that the managers should focus their attention to the processes and activities that contribute to creating and maximizing value for the consumer. The fifth characteristic is the influence of consumers on the business processes performances. Consumers, both internal and external ones, have a significant effect on the characteristics (performances) of the relevant process, its execution and control.

Operational characteristics of the process are largely related to the defined objectives of the process, which should be implemented through the processes realization. The first operational characteristic of the process is *identifying the persons responsible for the successful implementation of the process objectives*. The second operational characteristic is *defining the activities, operations and tasks* that are to be completed. The third characteristic is the *focus of the business process*, namely the focusing of the process management on the output (product/service, both of external or internal character), since the output of one process represents the input of the next process in the sequence (network) of the specified business processes in the company. The fourth characteristic is *defining the temporal dimension of the process*, because the duration (time needed for execution) of the process determines the amount of investment, i.e. commitment of resources to a single process. The fifth characteristic is the *process performance measurement* in order to assess the best possible process management.

Limiting process characteristics are those characteristics that restrict the output of the process, i.e. a product/service or a specific activity (Krstić, Sekulić, 2013, p. 417). These are: a) *variations* in the performances of business processes, b) *uncertainty* of the process

that occurs mainly due to the effect of subjective (human) factors in the process, c) *limiting* of the process output and resources.

Understanding and identifying of all process characteristics mentioned above is necessary in order to be able to best perform the classification process in a company, whose performances should be managed in the best possible way, and thus contribute to greater efficiency of the company.

2. CLASSIFICATION OF PROCESSES IN A PROCESS-ORIENTED ENTERPRISE

Operations of a company can be segmented in business and other work processes based on different approaches to this issue. Some companies identified from 5 to 6 such processes, while there are cases that some companies identified over 100 processes. However, it should be noted that these differences are not always the reflection of the complexity of operations in one company, but rather the result of the approach applied by the company's management to identify the processes at the very beginning of the process-oriented management approach implementation. Consulting firms have attempted to develop process classification schemes so as to support companies that choose to implement process-oriented management approach in the initial phase – process-identification phase.

The relevant literature classifies business processes in several ways: a) Following Harmon (2005) the crucial business processes are core processes, enabling processes and management processes. b) Keen (1997) suggests that there are processes that create value, processes that provide options and processes that sustain the value; c) According to Harrington (1997) there are following activities within a business process: high-value adding activities, value adding activities and low-value adding activities (Harrington, 1997). The above mentioned classifications are too general, therefore, when speaking of manufacturing companies, the following classification of business processes should be considered: *the process of supplying the necessary inputs, the process of designing and manufacturing products, the process of product selling and other marketing activities, the process of delivering products and the process of providing service to customers.*

In the literature there are usually references to the behavioristic processes as deeply rooted patterns of behavior, action and interaction. They are related to all aspects of organizational behavior. Primarily, they are related to cognitive and interpersonal aspects of the company's operations. This implies *decision-making, communication and organizational learning processes* (Krstić, 1999, p. 130).

The analysis of the relations between different processes in the company makes it possible to manage the company more successfully and the benefits of such an approach are the following (Krstić, Sekulić, 2013, p. 416): a) "improving the process of creating value for customers by helping managers to identify and improve all the relations and activities in the chain which creates value for consumers, b) enabling the focusing of the entire processes on the value that is being created through the basic (primary) process and the contributions of the basic business processes, c) encourage the managers to more systematically, thoroughly and effectively plan, coordinate and control the activities within the process, i.e. encourage the proper management of business processes."

3. THE CONCEPT OF BUSINESS PROCESS PERFORMANCES AS A DETERMINANT OF THE ENTERPRISE'S SUCCESS

Business process management incorporates in itself the concept of business processes performance management. Business processes performance can be determined as the result, effect or output of a business process or activity, which can be expressed through a quantitative or qualitative value. If we accept that a process represents a complex object of control, which consists of the activities, operations and tasks, then a conceptual framework of business process performance incorporates the following: the performance of the activities of a business process, the performance of operations included in the activities of a business process and performance related to execution of tasks within the operations (activities) of a business process.

The conceptual framework of a business processes performance requires the identification of *different dimensions of business process performance*, such as (Krstić, Sekulić, 2013, p. 420): 1) inputs and outputs of the processes and activities within the process, 2) process quality performances (reliability, safety, durability, statistical stability) (Djordjević, Milic-Janković, 2008, p. 110; Janković-Milić, Andjelković- Pesić, 2005), 3) process quantity performances (volume, scope of activities, scope of services, value flows), 4) temporal performances (speed of execution of activities, delivery time, the duration of execution of operations), 5) value performances (activity costs, output prices, etc.), 6) adaptability (flexibility) performances of a processes and its activities, 7) effectiveness of achieving target levels of processes performance and its activities, 8) efficiency of a processes, as well as the activities conducted within that process.

The conceptual framework of business process performance, according to the previously identified types of business processes includes the following five performance groups (sets): process performances related to supplying necessary inputs, process performances related to creating and producing products, process performance related to product sale and other marketing activities, product delivery process performances, process performances to the delivery of services to the consumers. Within each set of above specified performances a number of other performances can be identified based on the activities that can be identified in each of the mentioned processes and whose performances can be planned, measured (controlled), analyzed and improved by defining appropriate programs.

The development of the business process performance conceptual framework will be used for the purposes of business process performance management. For the effective business processes performance management, it is necessary to identify the elements of the process in terms of the input and output of each process. Understanding of inputs and outputs allows us to quantify, i.e. measure following complex and comprehensive (aggregate) process performances - process efficiency and effectiveness of the process.

Process efficiency is expressed by quantitative ratio of the results of the process operations (process outputs) and the investments necessary to achieve these results (process inputs). As such, the efficiency is expressed as the quantitative ratio of the process outputs and process inputs. The efficiency of the process can also be expressed as a quantitative relationship (ratio) of objectively conditioned and invested inputs (resources) in the process (Krstić, Sekulić, 2013). By comparing and establishing a quantitative relationship between the planned business process performance and actual business process performance, the *process effectiveness* is obtained (Krstic, Sekulic, 2013). In fact, it represents the effectiveness of achieving the target level of process

performance. Process effectiveness measures the degree to which the desired (planned) performance of the business process (defined as a certain output, effect, outcome, result) has been achieved (Krstić, Vukadinović, 2004).

Table 1 Dimensions of the business process performances
(adapted from: Krajewski, Ritzman, Malhotra, 2010, p. 33)

Key dimensions of the business process performance	Determining the Key process Success factors	Determining the Key business processes
Costs		
1. Low costs	offer a product / service whose price is relatively low compared to the competition prices in order to satisfy both internal and external process users	create a business process whose goal will be to reduce costs (market research costs, procurement costs, costs of production and sales, etc.).
Quality		
2. Top quality	offer the product/service which has the best features	it is necessary to create a business process whose output will be the product which fully complies with the customer requirements
3. Consistent quality	offer consistent product/service	the process must produce the product of a designed quality
Time		
4. Delivery speed	time interval between the order and delivery	business process must reduce the cycle time from the time of receipt of order until delivery
5. Delivery accuracy	number of deliveries carried out in a defined time interval	in addition to speed, it is essential that the process is designed so that the customer's order implements the agreed time
6. Development rate	how long does it take to introduce a new product/service	business process should be carried out so as to minimize the time from identifying customer needs to product development
Flexibility		
7. Customization	meet the unique needs of each customer by changing the design of products / services	company's ability to adapt to changing customer requirements
8. Variety	wide range of products/services	the output of a business process must be a wide range of products /services
9. Flexibility volume	flexibility of the capacities, flexibility of suppliers	create a process that could be subjected to modification in any manner that facilitates the introduction of potential changes in the process operation

The key dimensions of a successful business processes can also be defined as (Krajewski, Ritzman, Malhotra, 2010): *costs, quality, time and flexibility* (Table 1). These are actually the key to competing priorities of a modern business process-oriented enterprise. Hence, the *costs* seen as a key factor of business processes efficiency imply creating such business processes that would aim to reduce all potential costs. When it comes to *quality*, then we are talking about the striving to create processes that would be

focused on the production of consistent and high-quality products. In addition, business processes must be designed in such a way that the *time* (speed) and accuracy of delivery to customers, and the time of introduction of new products/services are fully tailor-made for the consumers' requirements. Finally, it is necessary to design a process that will be *flexible* enough, i.e. be able to meet the needs of consumers in terms of customization, product variety, and flexibility.

4. BUSINESS PROCESS PERFORMANCE INDICATORS

"Measurement is the act of recording successive developments of business events and processes" (Novicević, 2012, p. 95). The success in implementation of the target process performance and implementation of strategies and plans for improving business process performance can be measured and observed based on *quantitative and qualitative indicators* of the process performances. The quantitative process performance indicator represents a quantitative description of the determined objectives of the process and the extent of their realization. On the other hand, the features that are by their nature difficult to measure and to be expressed by numbers are, so to speak, "measured" by using qualitative criteria (Krstić, Sekulić, 2013, p. 76). In practice, the classification to *financial* and *non-financial* performance indicators is also present. Financial performance indicators are expressed in monetary terms and they are provided by the financial accounting information system. Non-financial performance indicators are expressed in non-monetary terms and are not provided by the financial accounting system. The process-oriented business management requires greater use of non-financial indicators in relation to the financial ones.

The set of selected indicators of a process performance will be helpful to the person responsible for the implementation of the process, as a member of the process management team, in controlling and solving problems of both strategic and operational character. The need for a set of indicators comes from the information requirements of the management in a process-oriented enterprise, as well as its process structure (the number of identified business processes, the complexity of certain process in terms of the number and character of the activities and so forth). There are three dominant levels of process performance indicators in the process-oriented companies and these are: a) indicators (financial and non-financial) at the company level or the business unit level (e.g. divisions), b) indicators (mostly non-financial) at the level of business processes identified in the company or at the level of business units (divisions), c) indicators at the level of activity within the process.

Measurement at each of the mentioned levels involves developing (selecting) the system of performance indicators in terms of choosing process indicators that will be used to control and manage business processes. Namely, for each of the identified business processes one should choose a certain number of measures that will be used for the control and management purposes to the persons responsible for a certain business process. The business processes performance indicators and the activities within them are mostly of a non-financial character.

Non-financial indicators are more suitable for the process, since the person responsible for a business process, as well as process teams will be able to better, faster and easier observe the functioning of the process and realization of its activities and operations by

using non-financial indicators. Furthermore, the person in charge of the business process will be able to make decisions and take appropriate measures for improvement and correction of problematic (inefficient) processes and activities.

Financial process and activities performance indicators are mainly used when describing the investment of resources necessary for the realization of the process in terms of expenses related to the business processes or the cost of activities within individual processes. Classification of measures used to measure business processes is possible to perform by identifying the types of business process. By accepting the conceptual framework of business process performances, which was previously mentioned, one could talk about the following performance measures in the manufacturing company: performance measures related to the process of supplying the necessary inputs, performance indicators related to the process of creating and manufacturing products, performance indicators related to the product sale and other marketing activities, performance measures related to the process of product delivery and performance measures related to the process of providing services to consumers.

The selection and identification of the key process performance indicators should be performed within each of the above listed five groups. It should be noted that this is only one of the many possible criteria for performance measures classification, which is done based on the defined business processes. Each company will identify key business processes by using appropriate criteria, and then select appropriate measures for each process which would help direct and manage particular processes.

However, it is interesting to note that the classification and selection of performance indicators can also be performed according to the so-called *competitive priorities of the modern business world*, which are: *time, quality, flexibility and costs*. A set of possible business process indicators sorted by the key determinants of the business success and competing priorities of the modern business environment are presented in Table 2. Business process performance indicators can be financial and non-financial in character. Costs represent financial process performance indicators, while time, quality and flexibility represent non-financial ones.

The performance measurement system in traditionally oriented companies is mostly based on financial indicators, while the non-financial indicators are used to the smaller extent. Financial indicators are to some extent a sound basis for decision-making which is the reason for their extensive use in practice (Merchant, Van der Stede, 2003, p. 414) in the companies characterized by traditional functional organizational structure. In modern, process-oriented enterprises, financial performance measurement system cannot be useful for the management purposes. The aim of using the non-financial indicators is to identify relevant performance areas, which, at the end of the process, reflect the performance of the company measured by the financial indicators - profit and profitability. In this way, by improving the non-financial process indicators, the positive effects in the overall efficiency of the company are generated, which are measured by the return on assets - ROA and/or by the return on equity - ROE.

Table 2 Non-financial and financial nature of the business process performance indicators

Process indicators	Non-financial indicators			Financial indicators
Key competitive priorities	Time	Quality	Flexibility	Costs
Process of supplying the necessary inputs	<ul style="list-style-type: none"> ▪ providing the necessary amount of process inputs on time ▪ providing appropriate types of materials on time ▪ the duration (length of time) of the process input delivery by the supplier 	<ul style="list-style-type: none"> ▪ possession of material quality certificate ▪ quality of information exchange between suppliers and particular company ▪ quality of input storage (materials) 	<ul style="list-style-type: none"> ▪ flexibility of suppliers in terms of purchasing conditions ▪ flexibility of storage and storage organization 	<ul style="list-style-type: none"> ▪ purchasing costs ▪ storage costs ▪ costs of material stockpiling
Process of creating and manufacturing products	<ul style="list-style-type: none"> ▪ time length from recognizing the needs of consumers to the new product development ▪ time needed for a new product development (from concept to realization) ▪ duration of the production cycle ▪ time needed for execution of particular production activities and operations 	<ul style="list-style-type: none"> ▪ the percentage of manufactured products with some defect 	<ul style="list-style-type: none"> ▪ flexibility of product mix ▪ flexibility in the development of new products ▪ manufacturing flexibility ▪ flexibility of the capacities ▪ flexibility referring to the scope of activities 	<ul style="list-style-type: none"> ▪ costs of materials ▪ equipment costs ▪ costs of initial, interphase and final quality control ▪ product storage costs
Process of product sale and other marketing activities	<ul style="list-style-type: none"> ▪ market research time ▪ time necessary for the generation of the idea on new products ▪ time necessary for the marketing campaign implementation ▪ time necessary for the preparation of the marketing campaign 	<ul style="list-style-type: none"> ▪ product brand ▪ company reputation based on its products/services 	<ul style="list-style-type: none"> ▪ pricing flexibility ▪ flexibility of promotion methods 	<ul style="list-style-type: none"> ▪ market research costs ▪ public promotion costs ▪ public relations costs ▪ costs of personal selling ▪ direct marketing costs
Process of product delivery	<ul style="list-style-type: none"> ▪ duration of transport ▪ delay in the product delivery 	<ul style="list-style-type: none"> ▪ delivery accuracy ▪ quality of delivered goods ▪ percentage of the deliveries of the products with some defects 	<ul style="list-style-type: none"> ▪ flexibility of the transport system 	<ul style="list-style-type: none"> ▪ transport costs ▪ insurance costs
The process of customer service	<ul style="list-style-type: none"> ▪ duration of product assembly ▪ time needed for servicing the customers ▪ time required for the replacement or repair of defective products ▪ time required to train customers to use the product 	<ul style="list-style-type: none"> ▪ rate of losing the customers ▪ rate of gaining new customers ▪ measure of the customer satisfaction ▪ rate of customer complaints ▪ rate of returned products 	<ul style="list-style-type: none"> ▪ measure of the flexibility of the services provided 	<ul style="list-style-type: none"> ▪ costs of the product assembly ▪ service costs (services) /consumers (in monetary units per annum)

5. THE CONCEPTUAL FRAMEWORK FOR THE DESIGN AND SELECTION OF THE BUSINESS PROCESS PERFORMANCE MEASUREMENT SYSTEM IN TERMS OF THE IMPROVEMENT OF BUSINESS PROCESS

The previous section of the paper explained how the selection and classification of the business process performance measures in an integrated performance measurement system of a process-oriented enterprise could be performed, taking into consideration the key competitive priorities in the modern business environment. The so-called *strategic approach* (Figure 2) enables much more reliable selection of business process measures in the so-called process measurement system of an enterprise (Krstić, 2012).

A process-oriented company possesses a clearly defined development strategy. The implementation of this strategy is the basis for the development of the strategies and programmes for the implementation of business processes. If the process-oriented enterprise represents a network of business processes, then the strategy of such enterprise could be seen as a subset of sub-strategies (programmes) for the implementation of the targeted business process performance.

Based on the formulated strategies and plans (programmes) for the realization of the targeted business process performance, it is necessary to identify the key success factors of business process (KSFs). The critical success factors of business processes are determined as specific operations and tasks that the managers of individual business processes should focus on in the continuous pursuit to improve the business process performance (Heckl, Moormann, 2010, p. 120).

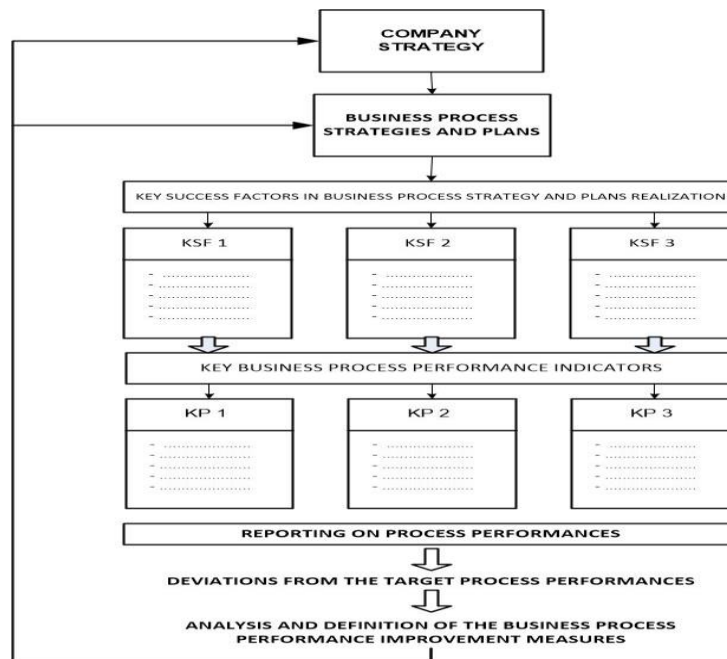


Fig. 2 Strategic approach to the selection of business process performance indicators in process-oriented enterprises (adapted from: Krstić, 2012, p. 172)

Identified critical business processes success factors should facilitate the choice (specification) of the appropriate key business process performance indicators (KPI) for particular KSF or business process. Namely, when the key objectives necessary for the successful realization of the business process are identified, it is easier to explain to the business process manager what should be monitored and controlled by using the appropriate performance measure/indicator. For each process, according to a determined crucial factor, a certain number of appropriate performance measures/indicators should be selected. There is no recommendation in terms of what number of indicators should be chosen for a single process. There are no universal recommendations, because it all depends on the complexity of the process itself, the number of activities in it, the number of operations, process resources and outputs.

6. IMPORTANT MOMENTS IN THE DEVELOPMENT OF BUSINESS PROCESS PERFORMANCE MEASUREMENT SYSTEM IN A PROCESS-ORIENTED ENTERPRISE

The key issue of effective business process performance measurement is the development of an adequate performance measurement system in a process-oriented enterprise. Such system should support the implementation of the existing strategies and plans for business processes improvement (Kueng, 1999, p. 154). At the same time, information on the measurements represent the basis for the analysis of the strategy implementation, as well as for taking corrective actions in terms of improving the performance of individual business processes (Sekulić, Krstić, 2005; Anđelković-Pešić, Milić-Janković, 2005).

Designing of a business process performance measurement system in a company includes the following stages: (1) Performance measurement system design, i.e. selection of business process performance indicators; (2) Preparation for the implementation of business process performance measurement system; (3) Implementation of the business process performance measurement system; (4) Finding opportunities for improving the business processes performance measurement system.

Performance measurement system design. - A company that chooses to implement process-orientation management must also work on changing the performance measurement system that used to be applied. In the phase of designing performance measurement system, i.e. selection of performance indicators for each business processes, it is necessary to make a decision about what will be measured and how it will be measured. The strategic approach is considered as the most suitable one for the selection of business processes performance measures, since this approach is based on the strategy and programmes for the business process improvement, as well as the identified business process success factors (Figure 3).

Elaboration of such a concept referring to the selection of the process performance measures based on the business process improvement strategy and programmes and identified business process success factors, involves determining the so-called *elements of the business process measurement definition*. The elements included in the definition of each selected criteria of a business process performance measurement system in a particular company are presented in Table 3.

It is necessary to check the appropriateness of the defined business processes indicators, as well as the criteria for their selection. The selection is usually performed from a large number of possible indicators, which the economic science and successful business

practice recommend for the tracking and controlling of business processes. When one wants to measure the performance features of the business process, it is necessary to understand and verify the elements included in the definition of the indicator, which are listed in Table 3.

Table 3 Elements of the definition of the business process performance indicators
(Krstic, 2012, p. 165)

Business process	Name of the performance indicator	Purpose of the measure	Calculation formula	Target level of the measure	Frequency of taking measurements	Reporting frequency	Data source	Person that performs the measurements	User(s) of the measurement results	Actions carried out by the users
Business process 1	Indicator A									
	Indicator B									
	Indicator C									
	...									
Business process 2	Indicator A									
	Indicator B									
	...									

Namely, for each selected business process performance indicator the following should be defined and checked: 1. *The name of the performance indicator* (most measures are specially determined for the control and tracking of a process, therefore they do not have a conventional name, which is the case with traditional financial performance indicators that have been used in financial analysis, i.e. financial management for a long time); 2. *The purpose of the business process measurement* (this should give an answer to the question what is measured by a particular performance indicator and why is it important to measure the particular process); 3. *A method of calculating the measure* (calculation formula, calculation method, the methodology applied in the process of data collection and processing, etc.); 4. *A target level of particular performance measure* (a planned level of a particular performance which is to be achieved in the future, i.e. planning period); 5. *Frequency of taking the measurements* based on the certain business process performance measurement (daily, weekly, monthly, etc.); 6. *Reporting frequency*, concerning the responsible persons and other persons responsible for the implementation of activities within a single process on the measured business process performance based on the certain performance measures; 7. *Information source* and the manner of collecting information for calculating the value of a certain process performance measure; 8. *The person who performs the measurement*, i.e. the person responsible for the measured and presented (reported) value of the process performance measure; 9. *Users of information on completed process performance measurement*, as well as actions carried out by these users (process managers and others) based on information obtained by the measurements taken.

Preparation for the implementation of business process performance measurement system. – Prior to implementation of a determined business process performance measurement system, due to the previously described selection of business process performance indicators, it is necessary to make appropriate preparations. The preparation involves screening for the existence of potentially redundant process performance indicators in a selected set (system) of business process performance indicators. This verification procedure for indicators should be carried out on the basis of the testing validity and reliability of the selected criteria. Validity is related to the extent to which the measure successfully quantifies the selected feature. Reliability is related to the degree to which "technique" and measurement methodology reveals the actual process performance changes over time and does not introduce errors in measurement results (Krstić, Sekulić, 2009, p. 90).

Implementation and improvement of the developed business process performance measurement system. – The actual implementation of the established business process performance measurement system in an enterprise involves daily use of certain indicators used for the control and information purposes on the achieved process performance (Martin, 2008, p. 34). Therefore, it is necessary to initiate appropriate actions to improve the business process performances based on the results of the measurements. If the implementation of actions for business process improvement does not take place, the measurement process as a part of the business process management will not contribute to the quality of the process and will only produce costs and expenses. The obtained information is first analyzed and consolidated in order to formulate and produce conclusions based on the performed analysis. Persons responsible for individual business processes should produce the assessment of the level of achieved performance, as well as determine what needs to be changed (shortened time span for activity realization, elimination of the non-value adding activities, improvement of the process output quality, etc.) based on the identified causes and effects. Before the obtained information is translated into actions, it should be checked for the following: potential errors in data collection, measurement errors, as well as the possible manipulation of certain data (Krstić, Sekulić, 2013, p. 91).

On the other hand, the continuous improvement of business processes performance measurement systems is necessary in order to keep the process useful and relevant for management (Krstić, Sekulić, 2013, p. 93). For this reason it is important to keep reviewing the process. Certain measures in the business process performance measurement systems can at one point of time become irrelevant for management, namely become redundant. Some indicators are introduced into the measurement system only as temporary indicators in order to control the problematic activities of a process at that particular time, and it can also happen that due to uncritical assessment of these temporary indicators they remain in a measurement system for some period of time. Redundant measures in the measurement system cause greater utilization of resources (increasing the costs of collecting information necessary for measurement) and loss of productive time of the persons performing the measurements and performance control. In addition, it may happen that one problematic business process or some area of its activity remain ambiguous due to the insufficient information, lack of indicators for monitoring the effectiveness of such an activity. This means that any new indicators must be introduced into the measurement system which would identify specific problems in implementation of the activities and operations incorporated in a particular business process. Of course, it is not the most appropriate to constantly introduce new indicators in business process performance meas-

urement system, because it increases the complexity of the measurement system, incurs unwanted costs and distracts the attention of the process management by making them focus on too many performance indicators that should be observed and upon which they should make decisions on possible business process performance improvements.

7. CONCLUSION

The developed performance measurement system has an important role in achieving a balance between the short-term results and long-term growth and development opportunities. It represents the basis for making good business decisions about the growth and development opportunities, the manner of their realization and strategic guidance, as well as the operational decision-making and implementation of the adopted long-term strategies. Adequate and integrated business process performance measurement system will help in the process of translating strategic plans into short-term actions and operational objectives, where the realistic assessments and decisions are made in terms of the efficient utilization of resources based on the real, comprehensive and accurate measurements and thanks to a quality set up and consistently implemented integrated measurement system, and which provide a realistic assessment on the efficient use of resources. In addition, an integrated performance measurement system enables monitoring of the process of implementation strategies. In the process of strategy formulation, measurement has an important role since it provides critical information for the proper definition of initial assumptions. At the end of the strategic process, integrated measurement system and the information that it provides are relevant for the reformulation of the strategy. With this in mind, such a measurement system represents an instrument used by the company's management in deciding about various business initiatives, programmes and projects, by whose implementation the strategy is being realized. Finally, a properly structured and equitable system of compensation has a quality integrated business process performance measurement system as its basis.

REFERENCES

1. Anđelković-Pešić, M., Janković-Milić, V., (2005) "Statistički instrumenti u funkciji unapređenja poslovnih procesa", *Poslovna politika*, maj, str. 38-41
2. Becker, J., Kugeler, M., Rosemann M., (2003) "Process Management – A Guide for the Design of Business Processes", Springer, Berlin
3. Bosilj-Vukšić, V., Kovačić, A., (2004) "Upravljanje poslovnim procesima", Sinergija, Zagreb
4. Đorđević, V., Janković-Milić, V., (2008) „Statistička kontrola procesa“, Ekonomski fakultet, Niš
5. Harmon, P., (2005) "Core, Management, and Enabling Processes", *Business Process Trends*, Vol. 3, No. 22, pp. 10-12
6. Harrington, H. J., (2006) "Process Management Excellence – The Art of Excelling in Process Management" Paton Press LLC, Chico, California
7. Harrington, J., (1991) "Business Process Improvement: The Breakthrough Strategy for Total Quality, Productivity, and Competitiveness", McGraw-Hill, New York
8. Heckl, D., Moormann J., (2010) "Process Performance Management", in: *Handbook on Business Process Management 2*, Springer, Berlin
9. Jacka, J. M., Keller, P. J., (2009) "Business Process Mapping", John Wiley & Sons, Inc, New Jersey
10. Janković-Milić, V., Anđelković-Pešić, M., (2005) Kontrolne karte i dijagrami u funkciji eliminisanja defekata u procesu, *Ekonomске teme*, br. 3, str. 111-117

11. Janković-Milić, V., Krstić, B., (2002) "Neke mogućnosti poboljšanja statističke kontrole procesa kao alata za povećanje efikasnosti poslovnih procesa", *Ekonomске teme*, br. 3, str. 149-159
12. Keen, P., (1997) "The Process Edge – Creating Value Where It Counts", Harvard Business School Press, Boston
13. Krajewski, L. J., Ritzman, L. P., Malhotra M. K., (2010) "Operations Management – processes and supply chain", Pearson Education, Inc., New Jersey
14. Kravčenko, K. A., Mešalkin, V. P., (2011) "Upravljanje velikom kompanijom", Fakultet tehničkih nauka, Novi Sad
15. Krstić, B., Sekulić, V., (2013) "Upravljanje performansama preduzeća", Ekonomski fakultet, Niš
16. Krstić, B., (2000) "Procesni pristup upravljanja preduzećem u funkciji povećanja njegove efikasnosti", *Poslovna politika*, decembar, str. 40-47
17. Krstić, B., (2009) "Intelektualni kapital i konkurentnost preduzeća", Ekonomski fakultet, Niš
18. Krstić, B., Anđelković-Pešić, M., Anđelković, A., (2010) „Upravljanje varijacijama u vremenu, kvalitetu realizacije i autputima aktivnosti u cilju povećanja efikasnosti poslovnih procesa preduzeća“, *Ekonomске teme*, 3, str. 343-353
19. Krstić, B., Vukadinović D., (2004) "Metodologija šest sigma u funkciji povećanja efektivnosti i efikasnosti poslovnih procesa", *Ekonomске teme*, 1-2, str. 391-397
20. Krstić, B., (1999) "Elementi i determinante upravljanja poslovnim procesima preduzeća", zbornik radova: *Upravljanje ključnim aspektima transformacije preduzeća*, Ekonomski fakultet u Kragujevcu, Kragujevac, 1999, str. 128-137
21. Krstić, B., Jovanović, S., Kahrović, E., (2012) „Process-oriented enterprise as a determinant of organization behavior in Contemporary Business Terms“, *Actual Problems of Economics*, No. 11 (137), pp. 369-379
22. Krstić, B., (2008) "Performance Measurement System for the Modern Business Environment", *Economic themes*, No. 4, pp. 15-26
23. Krstić, B., (2012) "Uloga strategijske kontrole u unapređenju poslovnih performansi", Ekonomski fakultet, Niš
24. Kueng, P., (1999) "Building a Process Performance Measurement System: some early experiences", *Journal of Scientific and Industrial Research*, Vol. 58, No. 3-4, pp. 152-165
25. Martin F., (2008) "A performance technologist's approach to process performance improvement", *Performance Improvement*, Vol. 47, No. 2, pp. 23-26
26. Merchant, K., Van der Stede, W., (2003) "Management Control System – Performance Measurement, Evaluation and Incentives", Prentice Hall
27. Novičević, B., (2012) „Mere performansi izvrsnosti ključnih menadžment procesa“, u zborniku radova: „Značaj računovodstva, revizije i finansija u procesu prevladavanja ekonomske krize“, Banja Vrućica 27-29.09.2012, Savez računovođa i revizora Republike Srpske, str. 77-96
28. Novičević, B., (2010) „Upravljanje poslovnih procesima kao izazov upravljačkom računovodstvu“, u zborniku radova: „Mogućnosti i ograničenja računovodstvene profesije u Srbiji“, Savez računovođa i revizora Srbije, Zlatibor, str. 200-214
29. Novičević, B., (2011) „Uloga i značaj mapiranja i procena tokova vrednosti poslovnih procesa u upravljanju modernih preduzećem“, u zborniku radova: „Nauka i svetska ekonomska kriza“, redaktor Evica Petrović, Ekonomski fakultet, Niš, str. 251-257
30. Novičević, B., (2012a) „Upravljanje bazirano na poslovnih procesima – conditio sine qua non efikasnog upravljanja modernim preduzećima, Nauka i svetska ekonomska kriza“, redaktor Evica Petrović, Ekonomski fakultet, Niš, str. 251-257
31. Sekulić, V., Krstić, B., (2005) "Unapređenje performansi poslovnih procesa preduzeća", *Ekonomске teme*, br. 3, str. 83-92.

DIZAJNIRANJE I IMPLEMENTACIJA SISTEMA MERENJA PERFORMANSI POSLOVNIH PROCESA

Upravljanje savremenim preduzećima pretpostavlja i primenu procesnog pristupa. Procesni pristup u upravljanju je neophodan jer pruža novu perspektivu menadžmentu u rasvetljavanju problematičnih, neefikasnih procesa i aktivnosti koje se negativno odražavaju na ukupnu efikasnost i konkurentsku poziciju preduzeća. Upravljanje preduzećem, usvajanjem i primenom procesnog pristupa, zahteva razmatranje problema dizajniranja sistema merenja performansi poslovnih procesa, kao vitalnog kontrolno-upravlačkog instrumenta. Preduzeća koja nisu koristila procesni pristup u upravljanju i koja žele da ga primene jer ih oštri konkurentski uslovi teraju na to, nužno treba da ustroje sistem merenja performansi poslovnih procesa. Stoga je cilj rada da rasvetli ključne momente u dizajniranju i implementaciji sistema merenja performansi u procesno orijentisanom preduzeću. Strukturu rada čini nekoliko celina. U prvoj se najpre razmatraju karakteristike procesne orijentacije i klasifikacija poslovnih procesa u procesno orijentisanom preduzeću. Nakon toga se razvija konceptualni okvir performansi poslovnih procesa. To je neophodno da bi se determinisao koncept merila performansi poslovnih procesa i dimenzija performansi poslovnih procesa. Postavljanje konceptualnog okvira performansi poslovnih procesa i merila performansi poslovnih procesa jesu osnove za razmatranje tzv. strategijskog pristupa u izboru merila performansi poslovnih procesa i postavljanju sistema merenja performansi poslovnih procesa u procesno orijentisanom preduzeću. Na kraju se pažnja fokusira na važne momente i etape u razvijanju sistema za merenje performansi poslovnih procesa u procesno orijentisanom preduzeću.

Ključne reči: poslovni procesi, merenje, performanse.