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ORGANIZATIONAL DEVELOPMENT THROUGH PROCESS-BASED MANAGEMENT: A CASE STUDY

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Abstract: Purpose: *The purpose of this technical paper is to describe the new approach to the organizational development coming from the mixture of continuous improvement models and business process maturity models. This approach is Organizational Development and the baseline for its application is a standard created by the Central European Association for Business Process management (CEABPM). It is the standard CEABPM 1001:2013 – Requirements for the process-based organization.*

Methodology: *The methodology for creating the new standard for Organizational Development is mostly a literature comparative analysis. Next, we discussed the standard in a sample of academic and business organizations. CEABPM 1001:2013 contains the requirements for process-based organizations as well as the method for quantifying the range of process orientation.*

Findings: *The paper introduces a novel approach to the organizational development based on the systematic management of the organization's maturity. The basis for this approach is the standard for the organizational maturity assessment: "CEABPM 1001:2013 Requirements for the Process-Based Organization" together with the methodology of its use as an integral part of the organizational evolution.*

Practical implications: *The standard is intended to work as an assessment tool for the audit of the level of maturity of the organization as well as a knowledge basis for its consequential development at the same time. The audit report as a main output of the organization audit process according to this standard contains detailed information particularly about detected aspects of the identified level of the process-orientation, and about their importance for the further development of the organization. The audit thus results not only in the determination of the level of process orientation, but also in a detailed identification of specific strengths and weaknesses connected with the identified state.*

Keywords: *organizational development, process-based management, requirements for the process-based organizations*

1. Introduction

Primal adaptability ensures the survival of a species. In its essence it concerns the reproduction and adaptation of genetic material passed on to the newly formed organism (system). Adaptability at the level of the genetic code is a phenomenal and unique mechanism. The ability to modify the structure of DNA (deoxyribonucleic acid) guarantees an organism the system of adaptability to ever-changing environmental conditions and also the survival of the whole species. Secondary adaptability is the ability to adapt to current environmental conditions and to restore internal structures and processes using the self-regulatory mechanisms of each organism. Unlike in living systems, **there is only the possibility of secondary adaptability in an enterprise** when the company responds to the unbalanced state in order to restore the balance. The basic mechanisms for maintaining equilibrium are the **innovative activity** of stakeholders involved in the processes, the **targeted optimization of the processes' critical points** and the **continuous measurement and evaluation of the processes' performance**.

The assumption that social systems are not balanced raises the question of finding the optimal internal organization of a company and defining the processes in a way that ensures the target orientation of the company. If we know the target orientation of the company, we should ensure the development of processes that lead to its fulfilment. An answer to the question of how to optimally organize the company management system can be found in the effectiveness of management, which means the ratio of the amount of one's own energy, time and costs incurred to achieve the company's objectives and the results represented by the fulfilment of these objectives. An important aspect of the management system is its orientation. The

orientation of the management system is determined by defining the structure of the company in which business processes take place. There are three basic types of orientation of a company's management system. The first one is the functional orientation where the basic structure of management consists of line managers and organizational units entrusted to them. The second type is **process-based management, where the basic structure consists of process owners and the company's process entrusted to him**. The third type is based on the process type. It is a project-based management system, in which the management structure consists of a project manager and a unique project assigned to him.

The answer to the question why a process-based management system is preferable to a functional one is quite simple. The three basic mechanisms of secondary adaptability (targeted optimization of processes' critical points, measurement and evaluation of processes' performance by a system of indicators and innovative activity of stakeholders involved in processes) can only be effectively applied if the management system is process-based (Kayode *et al.*, 2016).

Foremost the process-based management is a complex and difficult issue. Establishing such an approach to the organizational management requires a very complex change which is impossible to perform at once. It is also impossible to perform it as a single managerial decision with just the use of managerial power. Such a change is a long term evolutionary process which ought to be carefully managed.

The Business Process Management (BPM) can be integrated into a company's management system in two alternatives. The first one is the transformation of a functionally based management system into process-based and the other alternative is

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when creating a new company, which creates a process-based management system, right from the beginning. The process approach is applied in process-based management systems after the integration of process management. Then we can talk about the process-based management of companies. In this case it is necessary to identify all of the main and supporting processes in order to create an obligatory business process model and to define all its outputs applicable in practice (Veselovská *et al.*, 2015).

The title of the paper contains the term **Organizational Development**. It is not our goal to create new managerial terms. By using this term we simply develop well-known ideas and theories. The foundation is based on Deming's PDCA cycle and some Business Excellence models and Business Process Management Maturity models. Different approaches to the organizational maturity are described by many authors. An overview of approaches to the development of quality for the last 25 years is presented by Dahlgaard-Park, Chen, Jang & Dahlgaard (2013). Their papers focus on the core values/key principles needed to build a quality culture in terms of leadership, people-based management, continuous improvements, management based on facts, focus on the customer and how these have been increasing slightly over the last decade. Their findings also indicate that **Quality Management is now at a more mature stage** where its focus has shifted from being initially on Total Quality Management to tools, techniques, and core values which are needed for building a quality and business excellence culture. Similarly A. Brawn (2013) states that organizations all around the world adopt business excellence frameworks in order to guide their business strategy and continuous improvement. Some seek and receive awards which recognize high levels of achievement against the criteria of these frameworks. Corbett and Angell (2013) examine the approach, performance and progress in organizations that had previously made multiple applications for the New Zealand Business Excellence award.

Asif *et al.*, (2011) explore the adequacy of business excellence models (BEMs) to address **corporate sustainability**, which is conceptualized in terms of economic, social, and the environmental bottom line. They also examine how organizations may manage corporate sustainability in the absence of a comprehensive sustainability management system. Another view is presented by Hwang *et al.* (2010), whose SCOR model can be applied to analyze supply chain performance in a systematic way. It can also aid in communication among all members in the supply chain and can **assist in the development** of a design for a better supply chain network.

Organizational Development (OD) comes from BPM maturity models which set up the criteria for process-based organizations (Zavadský and Hladlovský, 2014). PDCA is the basic cycle for the OD determining the OD stages: Be **Process** based in the organization; achieve the **Equilibrium** by the three mechanisms of adaptability: (1) innovative activities of the process stakeholders, (2) process performance management system and (3) optimizing the critical points discovered by the process analysis; **Check** the BPM maturity accordance to the CEABPM 1001:2013 and **Act** in the case the C_{apo} is lower than 90 %.

Our paper consists of five sections. After this introduction, in the second section, the essentials of the process-based organization together with the importance of this approach to the management are briefly explained. The main problems to solve during the process of building the process-based organization are discussed using the model of the three main problem areas of the process-based organization and their mutual connections. The final part of the section contains a brief historical overview of the maturity models with special attention to the maturity model of an organization according to M. Hammer as an essential inspiration for the CEABPM standards. The third section is aimed at the CEABPM standard as a tool for the management of the organizational

development. The motivation as well as the contents of this standard is explained together with the way how to use the standard as a tool for the organizational development. The forth section is aimed at the application of CEABPM 1001:2013 in the selected company. We realized the verification of proposed criteria to verify its relevance by audit of process based management system. In Conclusions we summarize the contents and the main idea of the paper and outline the future plans of the development of the standards.

2. Process-based organization and maturity models

2.1. Process-based organization

During almost 20 years of existence of this approach, thinking in terms of business processes became a regular part of organization management practice. Nevertheless, the Business Process Reengineering and Process Based Management means much more than it is regarded in ordinary managerial praxis. First of all it is a real paradigmatic change in the theory of management. The complexity of this shift of the paradigm makes putting it into practice not easy moreover it is not easy even to understand the fundamental idea of this approach. Due to the facts mentioned above the full implementation of ideas of process-driven management are very rare. Most stories about using process-based thinking accent only marginal aspects of this approach like the partial improvement of evidence, reducing time, cost, automating agendas, etc. without the real fundamental change of running the business, which is the real substance of the idea. On the other hand there is no business area where the implementation of the Process-Based Management cannot bring dramatic improvement.

Hammer/Champy in Hammer, M., Champy, J. (1993) indicates two main characteristics

which should be regarded as an essence of the idea of process-oriented management:

- The main **critical reason** for this approach is the need for **making the organization flexible enough to be able to change its internal behaviour according to the changes in the environment**. These changes include not only changes of the customer preferences and needs but also the changes of the possibilities to satisfy them, which are typically caused by the technology development.
- The main **critical consequence** of the above-mentioned main reason is the **change** in the concept of business organisation **from strictly hierarchical to a collaborative one**.

Once this reason is fulfilled and the organization shifts from formerly hierarchical to the collaborative style of behaviour the organization can be regarded as managed in the process-oriented manner. Nevertheless, such a change requires many partial changes in all areas of the life of the organization where each of them can be regarded as critical. Moreover, the mutual relationships among these areas generate other consequential problems to solve. In the following text we outline and briefly discuss this complexity from the three essential perspectives.

Figure 1 shows how the three essential problem areas are connected within the process-based organization. All three exemplary viewpoints are figured together addressing all substantial parts of the organization's life: content, technology, and people. Each particular point of view is characterized by typical questions which should be answered by the methodology in that field.

Process-oriented management represents the basic idea of a process-based organization, expressed excellently by Hammer and Champy (1993) and originally

called “Business Process Reengineering”. - This idea argues for the fact that the organization has to build its behaviour on an objectively valid structure of its business processes to be able to fully exploit the possibilities offered by the technology progress. This condition is typically not fulfilled in traditionally managed organizations where a hierarchical organizational structure prevents seeing, as well as managing, the crucial process chains which should be the central subject of change due to technological progress. For achieving the required ability to fully exploit technological progress the traditional hierarchical way of management should be rejected and substituted with the management style based on the objectively valid model of the business processes of the organization. Realization of such an idea nevertheless raises the consequential questions:

- Which structure of the system of processes supports the process oriented management of the organization?
- How to identify key and supporting processes in the organization?

In order to make the organization flexible enough towards the possibilities of progress in technology one should firstly find the “right” structure of the system of the organization's business processes. This means at first to identify the key processes profiling the organization, and according to them then order all necessary supporting activities to so-called supporting processes. The key business process is such a natural process chain that covers all aspects from the initial need of a customer until the fulfilment of this need with the appropriate product or service. Nevertheless the definition above does not mean that the key process has to include all the activities necessary for the product/service delivery. It just has to cover all the process, i.e. to manage it using the services of supporting processes for ensuring the necessary productive activities/processes on the way to the final delivery. In such a way the key process represents the management

side of every business case while the supporting processes represent the production side. In the process of creating the basic structure of internal business processes in the organization via the decision about the border between the key and supporting processes the concept of Service plays the role of a universal separator. It gives the meaning of the border between the management and the production. The idea expressed above of a service-driven technique for creating the basic process structure of an organization is a root idea of the methodology MMABP which is one of the main methodical sources of the CEABPM standards. This technique is described in more detail by Řepa, (2011).

Cooperation is a crucial problem in the process of building the system of processes. Once the basic structure of processes is given the details of their particular relationships should be analyzed in order to harmonize the cooperation with the internal structure and contents of each process. Structural harmony means the synchronization of the internal process run at the same time as other processes – partners in the cooperation. Content harmony means taking each cooperation point as an act of communication of both processes. Considering this cooperation point as a *service* one can think about it as both dimensions in a harmonious whole: service always means delivering the right product at the right time.

Analysis of details of the cooperation of business processes naturally brings the consequential questions:

- Why and how should processes in the organization cooperate?
- Which attributes should their cooperation have (time, quality)?

As it is argued above the cooperation of processes always means their communication. The need for the cooperation follows primarily from the mutual positions of both processes. According to the above-mentioned MMABP methodology and consistently with the ideas of process-based management there are only two correct

reasons for the existence of the process:

- the purpose of the key process is implicitly undoubted: it is given by the fact that this process represents the direct way of satisfying the need of a customer, which is the universal

mission of any organization. The key process always represents the direct service to customers;

the purpose of the supporting process is given by the services by which this process supports other processes.

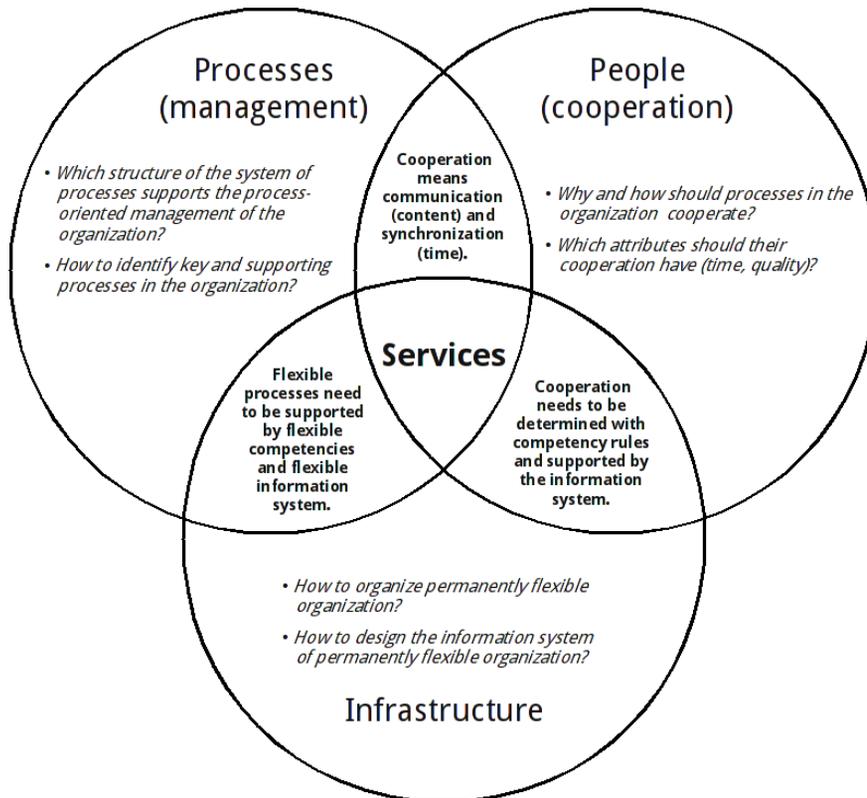


Figure 1. Service as a common denominator of content, technical, and human aspects of the organization management

Any cooperation between processes always means providing the service either directly for the customer or indirectly by supporting other processes. MMABP methodology contains the technique for the design of the cooperation structure of processes via the “internal outsourcing” of the production of process chains from the key processes. This natural way for the basic supporting of processes is created and cooperation as well as the basis of the structure of processes in the organization is established.

2.2. Process-oriented infrastructure

For putting the system of business processes into real life it is necessary to create the required infrastructures. There are two main kinds of infrastructures representing the two main resources in the organization: technological infrastructure representing the aspects of automation, and organizational infrastructure representing the people aspects of the organization's behaviour. As the main goal of the process-based management of the

organization is to make it principally and permanently flexible, its infrastructures also need to have these attributes. Thus there are two crucial questions to answer regarding the implementation of the process-managed organization:

- How to permanently organize a flexible organization?
- How to design the information system of a permanently flexible organization?

In Řepa (2011) the methodology for the design of the process-based organization is presented. The last step in the procedure called “Building resulting infrastructures” is based on the work with the structure of services identified in the previous steps. Services are identified as a general meaning of the relationships among business processes – their mutual cooperation. Details of every service (alias cooperation act) are described in the form of the Service Level Agreement (SLA) and are used in the last step of the procedure as a common basis for the creation of all required infrastructures: organization as well as information system. The organizational structure of the organization is then built directly on the structure of competencies derived from the mutual competency relationships of processes which are defined in their common SLA. So the rights and responsibilities of managers as well as regular attendees of both processes directly follow from the needs of the processes. This way the organizational structure is flexible and exactly in accordance with the flexibility of the processes.

Similarly the structure of the information system is derived from the mutual relationships of processes which are defined in their common SLA. SLA defines all necessary products of the service (alias processes cooperation act) and their quality as well as time attributes which is a perfectly sufficient basis for the decision regarding the necessary functionality of particular parts of the information system. The particular behaviour of the system is then given by the process itself because the basic functionality

is principally called by the workflow-management engine as an integral part of the system. The workflow management system is thus the basic condition for making the information system of the organization flexible enough in terms of the main principle of a process-based organization.

The common intersection of all three viewpoints is characterized by the concept of Service which represents their universal common meaning. The concept of Service as it is discussed above from all three viewpoints represents a common denominator of content, technical, and human aspects of the organization management.

2.3. Organizational maturity and maturity models

The application of maturity models is sometimes identified with the concept of process audit (Hammer, 2007). Such a broad understanding of maturity model application is mainly based on the scale, that is: how many aspects of process-based management system we are considering. Maturity models are reviewed by some authors in detail and they also compare their individual criteria. Palmberg (2010) compares the Gonçalves' maturity model, Lockamy and McCormack's model and Hertz's maturity model. All of them focus primarily on defining processes, measuring and evaluating performance and process improvement, organizational structure of company, mutual communication and information security of processes. Almost all maturity models are based on the Capability Maturity Model (CMM). Another maturity model which is often cited in literature is Fischer's model (Závadská, 2013). This model integrates five dimensions – strategy, control, processes, people and information technology. In each of these dimensions the level of process management is defined by limited expansion in the company, integrated at the tactical management level, managed by processes, company-wide optimization and a part of the intelligent hierarchical network. A

set of specific measures is defined in a matrix where the rows and columns meet the dimension and the level of dimension. Indicating the current status (where we are) and the desired state (where we want to get) creates an equivalent of a roadmap specifying the direction of development of process management and business processes (Wooluru, 2014). Závadská (2013) critically reviews a relatively large number of different models of the maturity evaluation of process management and business processes in her article. She lists a number of models that have been identified in managerial practice:

- 1) PEMM - Hammer's Process and Enterprise Maturity Model (2007).
- 2) 8 Omega - model of Business Process Transformation Group (2007).
- 3) CAM-I PBM Assessment – maturity model of business process management of the International Consortium for Management (2007).
- 4) BPM Maturity Framework – model of Gartner Company (2006).
- 5) Rosemann and Bruin's maturity model (2006).
- 6) Fischer's model of BPM maturity (2004).
- 7) Lockamy and McCormack's model (2004).
- 8) Hertz's maturity model (2001).
- 9) Goncalves's maturity model (2000).

Based on the analysis of available literature sources we can characterize the maturity model according to Michael Hammer, which is most often cited or reviewed by different authors and which we consider to be easily applied. It brings quick results in the improvement of process-based management systems and business processes.

In the article Hammer (2007), Michael Hammer stated that organizations need to ensure that their business processes become more mature, i.e. that they are capable of delivering higher performance over time. To realize this, the organizations need to develop two kinds of characteristics: **Process enablers**, the characteristics of individual

processes and **Enterprise capabilities**, the characteristics of the entire organization. The particular level of maturity of the organization is given by the compound quality of its processes according to their particular characteristics (Process enablers) together with the characteristics of the enterprise itself (Enterprise capabilities).

- **Design**
The quality of process design means the comprehensiveness of the specification of how the process is to be executed.
- **Performers**
The quality of people who execute the process address their skills and knowledge.
- **Owner**
The quality of process owner includes the responsibility of the proper senior executive for the process and its results.
- **Infrastructure**
The quality of infrastructure means how well the process is supported by the information and management systems.
- **Metrics**
The quality of measures which the company uses to track the process's performance.

Enterprise capabilities are:

- **Leadership**
How well the senior executives support the creation of processes.
- **Culture**
The quality of the enterprise culture is given by the values of customer focus, teamwork, personal accountability, and a willingness to change.
- **Expertise**
The quality of expertise includes the methodology for process redesign together with the skills for using it.
- **Governance**
The quality of governance addresses the mechanisms for managing

complex projects and change initiatives.

Hammer created the system of evaluation of the organization's maturity level by evaluation of the above mentioned characteristics taking mainly into account the fact that the overall quality of the organization is a complex characteristic where process enablers as well as enterprise capabilities express the necessary conditions for the quality but not all the quality. Thus the particular level of maturity requires the proper quality of all process enablers together with all the appropriate capabilities of the

enterprise. The maturity of processes therefore should go hand in hand with the enterprise capabilities and vice versa. It does not make sense if the organization feels the high-level maturity of its processes without respecting the adequate level of its capabilities (For example, it is quite usual that an enterprise regards its system of processes as perfect but at the same time keeps all the processes subordinated to its traditionally hierarchical organization. This fact is more proof of a fatal misunderstanding of the basic principles of process-based management than a serious message about the enterprise's maturity).

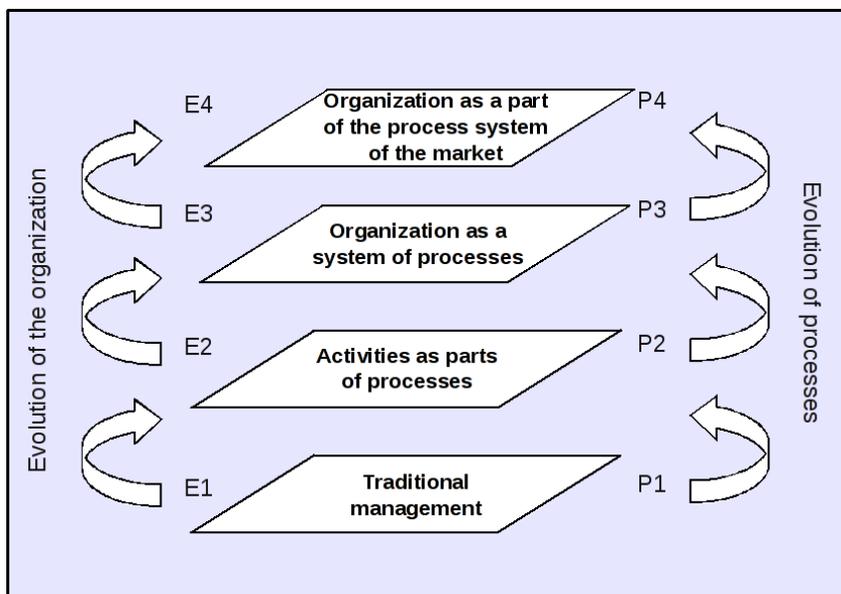


Figure 2. Model of maturity of an organization and its processes according to M. Hammer

Hammer formulated four levels of the maturity of enterprise (and its processes). These levels can be characterized as shown in Figure 2:

- **Traditional management.** At this level the notion of processes already exists in the organization but the meaning of the concept of “process” is still not clear nor commonly accepted. The consequences of this state are: the constructed processes

still cover just fragments of the whole business case (i.e. real key process), the actors emphasize just partial / local improvement and personal contribution in the frame of the line organization, the infrastructure is still fragmented according to the line organization, and also the used metrics and their usability are limited by this fragmentation.

- **Activities as parts of processes.** This level brings the process oriented view of the organization's activities. Every particular activity is a part of some process which expresses its contextual value. The process represents the basic criterion, value, as well as the common denominator for all definitions, descriptions, behaviour, approaches and attitudes of actors, and is the main subject of the organization of infrastructures and metrics.
- **Organization as a system of processes.** At this level every process is principally regarded as just a part of the process system of the organization. The basic criterion, value, common denominator for all definitions and descriptions, behaviour, approaches and attitudes of actors, and the main subject of the organization of infrastructures and metrics is the organization. All target values and the meanings of all activities are related to the organization. Particular processes are principally seen in the common context.

Organization as a part of the process system of the market. At the highest level all processes are seen not just in the context of the organization but in the context of their target meaning for customers. Thus all particular decisions principally overcome the borders of the organization towards customers as well as co-operators. Consequently the structure of processes follows the overall context of customer needs. The behaviour, approaches and attitudes of actors are targeted to the values provided outside the organization. The organization of infrastructures respects the professional and technology standards in order to be principally compatible with the infrastructures of customers and co-operators including the adequate conception of metrics and their permanent link to the strategy.

3. The CEABPM standard as a tool for Organizational Development

We consider Organizational Development to be a systematic way of organizational development based on the CEABPM 1001:2013. We propose a unique standard for process-based organizations that can help organizations to achieve a BE (business excellence). The aim of the CEABPM 1001:2013 standard is:

- 1) to define the basic terms and concepts of Business process management;
- 2) to describe the selected maturity models of process-based organizations;
- 3) to define the requirements for process-based organizations as the process audit criteria;
- 4) to determine the general procedure for the audit of the process-based management system, issuing certificates and their renewal;
- 5) to create conditions for the implementation, maintenance and development of process management in organizations.

This standard establishes requirements for the management system and process model of an organization regardless of the content of business processes, their interactions and outcomes. It serves as a foundation for the verification of a process-based management system and for **setting more detailed milestones for its further development** as a basis for Organizational Development. Organizational Development based on CEABPM 1001:2013 has four stages with the acronym **PECA**. Be a **Process-based** organization in accordance with the CEABPM 1001:2013; achieve **Equilibrium** by the three mechanisms of adaptability: (1) innovative activities of the process stakeholders, (2) process performance management system and (3) optimizing the

critical points discovered by process analysis; **Check** the BPM maturity in accordance with CEABPM 1001:2013 and **Act** in the case the C_{apo} is lower than 90 %.

PECA are integrated to the CEABPM 1001:2013 as its requirements. The structure of our proposed standard contains ten main paragraphs (3.1. – 3.10.):

- 3.1. Awareness of principles of process management
- 3.2. Responsibilities and competences in the business processes
 - 3.2.1. Responsibilities and competences of top managers
 - 3.2.2. Responsibilities and competences of process owners
 - 3.2.3. Responsibilities and competences of workflow managers
 - 3.2.4. Responsibilities and competences of process executors
- 3.3. Business process model
 - 3.3.1. General requirements
 - 3.3.2. Content of business process model
- 3.4. Description of business processes and activities
 - 3.4.1. General requirements
 - 3.4.2. Description of business processes
 - 3.4.3. Description of activities
- 3.5. Measurement and evaluation of business processes
 - 3.5.1. General requirements
 - 3.5.2. Time differentiation of measurement and evaluation of business processes
 - 3.5.3. Definition of the relationships among business processes through SLA (Service Level Agreement)
- 3.6. Innovation of business processes
 - 3.6.1. General requirements
 - 3.6.2. Target optimization of business processes
 - 3.6.3. Audit of the business process content
 - 3.6.4. Innovation of business processes through measurement and evaluation
 - 3.6.5. Innovative activity of process owners and process executors
 - 3.6.6. Innovation of process-based management system
- 3.7. Change management in process-based organization
 - 3.7.1. Starting points of process change
 - 3.7.2. Project of process change
 - 3.7.3. Changes in business process model
- 3.8. Information system for process-based organization
 - 3.8.1. General requirements
 - 3.8.2. Requirements for the information system
- 3.9. Organizational standards following-up the business processes
- 3.10. Obligatory of process management in organization

When defining the **requirements for the awareness of process management** we took Hammer's PEMM and focused on how the company is supposed to create conditions for the development of process management at all corporate levels. There were two basic groups of employees (process owners, process executors) defined in **the requirements for the competences and responsibilities in business processes**. We also defined their responsibilities and competences in meeting the objectives and outcomes of a given process. **Requirements for the business process model** can be defined as all the necessary elements of the process model which the company should include and describe them so that the process management can become obligatory for the company. We have identified requirements which set minimum characterizations for processes and activities in the description of business processes and activities in order to make them understandable to all stakeholders and so that they can be implemented, ensured and developed based on this description. We took as the basis the well-known information about the measurement and evaluation of performance which is available in the works of many authors **in setting the requirements**

for measuring and evaluating the performance of business processes. We formulated these requirements in the context of a process-based management system. When formulating **the requirements for business processes innovation** we took as a basis the systems approach to the innovative development of a company which is based on three innovations: the innovation of processes after the organizational audit, the innovation of processes as a result of the measurement and evaluation of performance and the innovation of processes as a result of the innovative activities of stakeholders. The **requirements for the change in management in a process-based organization** are defined as the requirements related to the implementation of specific changes. Although these requirements do not have specific changes described, we state how the company should proceed with their implementation and follow the innovation of business processes. We propose the **requirements for an information system for a process-based organization** in terms of the development of information technology for the direct and indirect support of process management and business processes. We do not determinate specific information systems or application software. We just specify the minimum requirements for their functionality. **The requirements for organizational standards** following processes are defined as a way for a company to include organizational standards into a process model in order to avoid violation of the principle of the management's unity. We incorporate **the requirements as obligatory of process management** in the company into standard mainly because of the sustainability of process management after its introduction into the management system. This way the management system could not spontaneously modify itself from process-based to functionally-based. It is especially true in cases when the process orientation was achieved through transformation from functional orientation.

To check the maturity means to do a process audit according to the CEABPM 1001:2013 standard. We propose the C_{apo} index for quantifying the organizational maturity. Its quantification is determined based on a numerical scale as stated in article 6.2. of the VDA 6.3 standard from 2010. The rating assigned to each point is **a combination of the extent of compliance with the requirements** of CEABPM 1001:2013 and **the scope of its description** in the process model or organizational standard following-up the business process model. Based on these combinations 9 options of evaluation may arise in process audits. They are listed in Table I.

The quantitative capability of the organization to implement, maintain and to innovate a process-based management system is given by the total degree of process orientation C_{apo} . The values of capability are given in Table II. The audit of the process-based management system, evaluation of the scale of fulfilment of requirements and their descriptions as stated in Table II serve as a foundation for the determination of the overall level of process-based management system C_{apo} – the quantification capability to implement, maintain and innovate a management system based on the process approach according to the formula:

$$C_{apo} = \frac{\sum_{i=1}^n C_{apo}^i}{n} [\%] \quad (1)$$

in which the C_{apo}^i is a partial degree of fulfilment of the selected article of the standards articles from 3.1 to 3.10., while $i=1, 2, \dots, n$ and $n (1, 10)$. The partial degree of fulfilment of the selected article can be calculated using the following formula:

$$C_{apo}^i = \frac{C_i}{M_i} 100 [\%] \quad (2)$$

in which C_i is the total number of points scored by evaluating compliance with standards in the i -th article and M_i is the maximum number of points that can be

achieved through implementation of the i -th article of the standard.

Table 1. Scale for CEABPM 1001:2013 requirements fulfilment

Number of points	Evaluation
10	<ul style="list-style-type: none"> The requirement is fulfilled completely and is fully described in the process model or in the organizational standard follow-up business process model
8	<ul style="list-style-type: none"> The requirement is fulfilled completely and is partially described in the process model or in the organizational standard follow-up business process model The requirement is fulfilled completely and is not described in the process model or in the organizational standard follow-up business process model
6	<ul style="list-style-type: none"> The requirement is fulfilled partially and is fully described in the process model or in the organizational standard follow-up business process model The requirement is fulfilled partially and is partially described in the process model or in the organizational standard follow-up business process model
4	<ul style="list-style-type: none"> The requirement is fulfilled partially and is not described in the process model or in the organizational standard follow-up business process model The requirement is not fulfilled and is fully described in the process model or in the organizational standard follow-up business process model The requirement is not fulfilled and is partially described in the process model or in the organizational standard follow-up business process model
0	<ul style="list-style-type: none"> The requirement is not fulfilled and is not described in the process model or in the organizational standard follow-up business process model

Table 2. Values of the degree of process orientation

Capo [%]	Verbal evaluation
90 – 100	Process-based management system of organization
60 – 89	Combination of functionally and process-based management system of organization
0 – 59	Functionally based management system of organization

4. Application of CEABPM 1001:2013 in the selected company: a case study

CEABPM 1001:2013 standard defines the requirements for the process model, particularly on the process model outputs, which are used to operate the managers' practise. The companies that have implemented CEABPM 1001:2013 can request the independent organizations for management system certification to execute the process audit.

4.1. Profile of the selected company

The analyzed company is a medium-sized enterprises in Slovakia specializing in traditional metal work. The company focuses on the delivery of components and subassemblies for the final producers of machinery, equipment and facilities. The main activities consist of the processing of semi-finished products by machining, welding, bending, cutting, separation of material and heat treatment. The company puts emphasis on ensuring quality, ensuring a functional monitoring system and the continual improvement of the process and operations in the production (Nestic *et al.*,

2015). The company takes a set of indicators for evaluation and monitoring, thereby increasing its efficiency and profitability.

The company owns the certificate STN EN ISO 9001:2009, which declares the creation, documentation, implementation and maintenance of a quality management system in accordance with the requirements of international standards. The company also owns the certificate EN ISO 14001:2005, which is committed to meeting the requirements of the environmental management system. Through this certificate, it is able to contribute to the reduction of negative impacts on the quality of the environment, and the prevention and awareness of environmental impacts in all creative processes. The company declares the quality of special procedures that are related to welding by the requirements of standards such as STN EN ISO 3834-2 (Welding Quality Management System) and DIN EN 15085-2 (Welding of railway vehicles and components).

The selected company was certified by the CEABPM 1001:2011 standard in 2012. The project of implementation of the requirements for the Process Based Organizations took one year.

4.2. Profile of the selected company

An audit of the process-based management system is an effective tool/instrument, for which the general instructions on auditing of management systems have been elaborated according to the clauses of the ISO 19011:2011 standard. The individual stages that are mentioned in the ISO 19011:2011 standard can be modified in order to audit the process-based management system that has been executed independently from standardized management systems. Amongst the most important operations of the audit that are necessary for an expeditious auditors' orientation and for the audit execution of the process-based management system, we can include:

- 1) the selection of the reference standard or maturity model containing requirements of the process-based management system,
- 2) the preparation of the questions catalogue for the auditor requisite resulting from the reference standard requirements,
- 3) the review of the process model of the company, organizational standards and reference documents related to the processes of the company,
- 4) the auditor executes an audit, where the auditor measures the fulfilment of requirements of the process-based management system through the auditor's questions catalogue. The auditor has collected and summarized evidence that is related to the specific requirement of the standard oriented on the process-based management system in the company,
- 5) the assessment of the level of the process-based management system of the company using the quantifiable technique,
- 6) to elaborate a register of bottlenecks of the company's management system for those requirements, in which the assessment was achieved at the 0-8 level and prepare the project scheme of changes,
- 7) the implementation of the project of changes that ensure the elimination of bottlenecks in the company's management system. It can also mobilize an innovation potential as a result of the increasing process orientation of the company,
- 8) to monitor and control the project of changes and review their benefits.

4.3. Results and verification of proposed criteria of the process orientation audit

The main objective of the verification of the proposed criteria by the process orientation of

the management system audit is the confirmation or refutation of the hypothesis, in which we postulate that by the application of the proposed criteria in the audited company, we will be able to identify the scope of the process orientation management system for the analyzed company.

It is necessary to consider not only the declarative approach to the process management system, but also the application approach to it. Only the declarative approach, when many companies state that they belong amongst process-oriented companies, does not reflect the real usage of the process management system in business practise. We identified that the scope of the process model, which represents process-oriented management systems, are the linearly dependent variables.

We tried to suggest the requirements for a process-oriented company in order to assess it by quantitative method, based on the theoretical resources and practical assumptions and facts. The assessment method was taken from the VDA 6.3. standard, which we subsequently modified. The proper level of process-based management system was suggested, and it contains the Capo index and the intervals for determination of the rate, when the companies are process or functional oriented. It closely depends on the ability of the proposed criteria, procedure and method that are used by assessment of the audit of the process-based management system. We can clearly specify whether the company is process or functional oriented, or its management system is a combination of both approaches.

4.4. Verification procedure of proposed criteria of the process orientation audit

We realized the verification of the proposed criteria to verify its relevance by audit of the process-based management system. The verification was realized in the succession of consecutive steps:

- 1) the definition of the conditions for the selection of the company,
- 2) the selection of the company for the verification of the proposed criteria,
- 3) the review of the organizational standards and business process model,
- 4) the preparation of the questions catalogue according to the requirements viewed in appendix,
- 5) design a method for an evaluation of the scale of the fulfilment of individual requirements using an automated method by means of MS Excel,
- 6) the verification of the requirements of the process orientation in the selected company directly,
- 7) the enumeration of the partial degree of the process-based management system - C_{apo}^i ,
- 8) the enumeration of the overall level of the process-based management system - C_{apo} ,
- 9) assess the relevance of the proposed criteria to identify the scope of the process-based management system in the analyzed company,
- 10) the confirmation or rejection of the hypothesis.

4.5. The definition of the conditions and the selection of the company to verify the proposed criteria

The process of the company selection was based on a variety of postulates. One of the main postulates was the existence of the certified quality management system, based on ISO 9001:2008. The fact is that many companies, especially small and medium-sized companies, have not established a business process model as a requisite tool for the management system. Consequently, the additional postulate was that the analyzed company should have the obligatory business process model. This postulate ensures that it will be possible to verify all the proposal requirements for a process-oriented company.

The concluding postulate is the existence of cyclically recurring processes in the analyzed company in order to segregate the project-oriented management systems due to the identification of the prevailing process-based management system of the company.

In general, we can summarize all the necessary conditions for the selection of the company to verify the proposed criteria with these assumptions:

- certified quality management system, based on ISO 9001:2008,
- obligatory Business Process Model for the process-based management system,
- existence of cyclically recurring processes.

We were able to compile an ensemble of the companies, which fulfilled the requirements by realization of primary research. We created an ensemble of 34 companies, specifically 22 medium-sized companies and 12 large-sized companies. We chose the selected company because this company allows the realization of the audit of the business process management system by reviewing the business process model and the verification of the requirements in the company's conditions directly. The selected company is medium-sized enterprises and has 198 employees.

4.6. The review of the organizational standards and business process model

We made a request to the company for all the organizational standards that the management or the external organizations have created for the analyzed company. We also requested a business process model for reviewing the organizational standards. We reviewed the organizational rules, the company's competency system, the working procedures and the quality manual for the organizational standards. The business process model was elaborated in the application QPR Process Guide software, which is specific software used to support the process management

orientation. Our conclusion is that the organizational standards are an essential part of the business process model. The company has a sufficient business process model, which is used for process-oriented management in the company's operation. The business process model contains a database of employees, technical facilities known as a resource group hierarchy, an information hierarchy, an organization hierarchy and a process hierarchy. From the process of reviewing the business process model, the result was that the process owners are also line managers for a particular level of management in the company. This fact is not contrary to the principles of process management.

4.7. The preparation of the questions catalogue and the design of a method for an evaluation of the fulfilment of the requirements

We elaborated a catalogue of questions based on the proposed requirements that is considered as criteria of the performed audit. In the questions catalogue the requirements were transformed into the form of questions in order to identify whether the individual requirements were fulfilled completely, fulfilled partially or not fulfilled. The degree to which the management system was process-oriented was evaluated by MS Excel software that allows users to organize, format and calculate the necessary data with formulas using a spreadsheet system.

4.8. The verification of the requirements focused on the process orientation of the company

The catalogue of questions was used to review each requirement directly in the company's conditions. The company's quality manager had the main role of collaborator, who accompanied us. The quality manager sent us the company's business process model; therefore, some requirements were reviewed by preliminary

research, and it was not necessary to verify them again. The quality manager provided us with all the important documents and relevant evidence that proved the actual degree of fulfilment of the requirements. We obtained an overall score of fulfilment for each question after finishing the verification process. Based on the process of verification, we stated that the analyzed company could not obtain the 100 % rate of Capo index, because the requirements were not fulfilled completely. The verification process was realized in July and August of the year 2015. The main aim of our case study is the verification of the proposed criteria, not the real performance of the audit of the process-oriented management system. This fact represents the reason, why we did not elaborate an Audit Report and the list of critical bottlenecks as a postulate for innovations in the management system of the company. We offered the company the evaluated catalogue of questions as a tool for the direct identification of the degree of fulfilment of requirements. It is also a helpful resource to identify the bottlenecks as the potential for innovation in order to make a decision about what ways, time, resources and methods must be used for the elimination of these bottlenecks.

4.9. The enumeration of the overall Capo and partial Capo level of the process-based management system

If the verification process of the proposed criteria in a company's practise is finished, the point score of the individual question is known. The next step is to calculate the partial degrees of the process-oriented management system using the following formula:

$$C_{apo}^i = \frac{C_i}{M_i} 100 [\%] \quad (3)$$

We calculated the percentile score of partial degree of the process-oriented management system as the proportion of points obtained for each individual requirement in the process-based organization, which were

grouped into ten main paragraphs, and the maximum number of points that could be obtained for each of these paragraphs:

- a) Awareness of principles of process management: $C_{apo}^1 = 82/90 \times 100 = 91 \%$.
- b) Responsibilities and competences in the business processes: $C_{apo}^2 = 316/330 \times 100 = 96 \%$.
- c) Business process model: $C_{apo}^3 = 156/160 \times 100 = 98 \%$.
- d) Description of business processes and activities: $C_{apo}^4 = 148/150 \times 100 = 99 \%$.
- e) Measurement and evaluation of business processes: $C_{apo}^5 = 254/330 \times 100 = 77 \%$.
- f) Innovation of business processes: $C_{apo}^6 = 208/240 \times 100 = 87 \%$.
- g) Change management in the process-based organization: $C_{apo}^7 = 120/140 \times 100 = 86 \%$.
- h) Information system for the process-based organization: $C_{apo}^8 = 104/110 \times 100 = 95 \%$.
- i) Organizational standards following-up the business processes: $C_{apo}^9 = 88/90 \times 100 = 98 \%$.
- j) Obligatory of process management in organization: $C_{apo}^{10} = 66/70 \times 100 = 94 \%$.

The graph represents values that are the results of partial degrees in a process-oriented management system. It shows that the analyzed company has bottlenecks in fulfilling the requirements mainly in paragraphs related to the measurement and evaluation of business processes, the innovation of business processes and of change management in the process-based organization. The company achieved values higher than 90 % in the rest of areas. The priority of the case study was to find areas where the company has inadequacies and whether the proposed criteria are able to assess the process-oriented management system as complex.

It is necessary to express the overall level of the process-based management system

according to the formula, in order to determine a company's ability to establish, sustain and develop the process management system. The value is calculated as the arithmetic average of the obtained partial degrees of the process-oriented management system Capo1 to Capo10. The analyzed company reached the value of 92 % as a proportion of the sum of the partial degrees,

which is divided by the number of paragraphs (in our case, it consists of the ten paragraphs). We can declare that the analyzed company has a process-based management system, because the final value of the overall Capo index is situated in the range of 90 -100%. The company received a list of the requirements that it has fulfilled partially or it has not fulfilled at all.

Criteria	Number of points
3.3.1. The requirements for awareness of process management	
3.3.1.1. Awareness of principles of process management	
1v Does the company initiate and develop the awareness of the principles of process management at all levels of company's management? (Review if the employees at the individual levels of management have aware of the principles of process management)	10
2a Have the employees understood the fundamentals of process management? (Review the selected group of employees by verbal interviewing + give an example)	8
3a Do the employees realize the innovation of the processes actively using a process approach? (Review the selected group of employees, if they have used the process approach by realizing a particular change)	8
4b Is the teamwork a basis postulate for achieving the objectives of the process? (Review if the teamwork is outweighed - the current number of teams and the durability of teams according to the processes)	10
5c Do the employees know the requirements of stakeholders in the processes? (Review if the employees know the stakeholders of company - nominate the examples)	8
6c Do the employees know the requirements of the external customers of their processes? (Review if they know for who, what and how to realize processes)	10
7d Do the employees perceive their own responsibility for the results of the processes, results of the company, the fulfillment of customers' requirements and the innovation process? (Review, how the employees perceive their role in the process-based organization by interview)	10
8a Do the employees perceive the process innovation as part of their daily work? (Review, if the employees look for bottlenecks and give a suggestions for its elimination daily)	10

Figure 3. A Sample of the Catalogue of questions processed in MS Excel

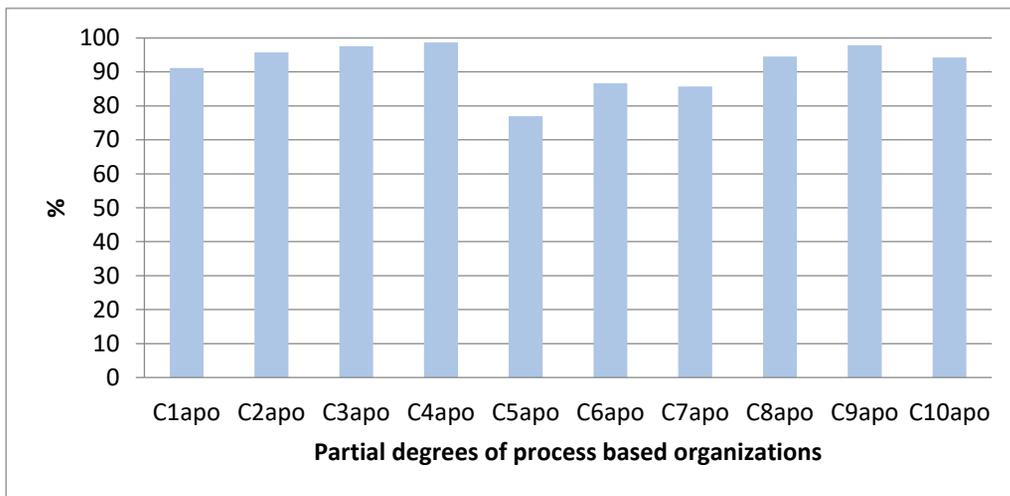


Figure 4. Values of the partial degrees of process-based organizations by verification of the proposed criteria of the process audit

It is necessary to express the overall level of the process-based management system according to the formula, in order to determine a company's ability to establish, sustain and develop the process management system. The value is calculated as the arithmetic average of the obtained partial degrees of the process-oriented management system Capo1 to Capo10. The analyzed company reached the value of 92 % as a proportion of the sum of the partial degrees, which is divided by the number of paragraphs (in our case, it consists of the ten paragraphs). We can declare that the analyzed company has a process-based management system, because the final value of the overall Capo index is situated in the range of 90 -100 %. The company received a list of the requirements that it has fulfilled partially or it has not fulfilled at all.

4.10. Assessment of the relevance of the proposed criteria to identify the scope of the process-based management system in the analyzed company

The proposed criteria are relevant and demonstrated the ability to identify the scope of the process orientation control system. This fact is based on:

- our review of every individual part of the management system in the analyzed company,
- all parts of the business process model were reviewed by the proposed criteria,
- all requirements were reviewed in cooperation with the quality manager of the company according to the catalogue of questions,
- we were able to quantify the overall and partial level of the process-based management system and we were able to quantify the range of the fulfilment of the individual requirements with the catalogue of questions.

We can confirm that through the application of the proposed audit criteria of the analyzed

company, it is possible to identify the scope of the process-based management system. This fact confirms the hypothesis.

5. Conclusions

The paper introduces a novel approach to organizational development based on the systematic management of the organization's maturity using the standard for the organizational maturity assessment: "CEABPM 1001:2013 Requirements for the Process-Based Organization" together with the methodology of its use as an integral part of the organizational evolution. The standard works as an assessment tool for the audit of the level of maturity of the organization as well as a knowledge basis for its consequential development. The Audit Report as a main output of the organization audit process according to this standard contains detailed information particularly about the detected aspects of the identified level of the process-orientation, and about their importance for the further development of the organization. The audit thus results not only in the determination of the level of process orientation, but also in a detailed identification of specific strengths and weaknesses connected with the identified state. This information should be exploited to focus the further development efforts in terms of the general principles of the organizational maturity model. In this way, the organization gains a powerful tool for designing sophisticated strategies for further action of organizational development under the rules of the maturity model. At the same time each performed audit also brings an important experience which should be used for the improvement and further development of the standard itself. This ensures that even the standard has the same dynamics as all other aspects of the process-based organization. This paper reviews the initial methodological resources concerning the organizational maturity models in the field of process-oriented management and discusses the crucial role of standards in the organizational

development. Then the essence and the contents of the standard together with the rules for its use are explained.

Regarding the main features of our approach we see as the critical point of the future development of the standard its evaluation in multiple implementations in real business. In our opinion and according to our experience with implementing the ideas of process-based management there is no danger that we will find our idea of “maturity-based organizational development” completely wrong. The evaluation should therefore answer the following main crucial questions:

- 1) What are the practical conditions for putting the idea of permanent self-development of the standard according to the experience from performed audits into the real life of the organization and what tools does it require?

- 2) To which extent the experience from using the standard in different organizations can be generalized and used for the development of the standard itself in order to share this experience in the community? Particularly:

- Would it be useful to create more detailed sub-standards specific for the organizations on the same level of maturity?
- Can it be expected that even the maturity model itself will be the subject of evolution, especially the levels of maturity (i.e. can we expect a new maturity level(s) in the future)?

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References:

- Asif, M., Searcy, C., Garvare, R. & Ahmad, N. (2011). Including sustainability in business excellence models. *Total Quality Management & Business Excellence*, 22(7), 773-786.
- Brown, A. (2013). How do excellent companies stay excellent? *Total Quality Management & Business Excellence*, 24(1-2), 108-118.
- Corbett, L.M., & Linda, C. & Angell, L.C. (2011). Business excellence in New Zealand: continuous improvement, learning, and change. *Total Quality Management & Business Excellence*, 22(7), 755-772.
- Hammer, M. & Champy, J. (1993). *Re-engineering the Corporation: A Manifesto for Business Revolution*. New York: Harper Business
- Hammer, M. (2007). The Process Audit. *Harvard Business Review*, 85(4), 111 – 123.
- Hwang, Y.D., Wen, Y.F. & Chen, M.Ch. (2010). A study on the relationship between the PDSA cycle of green purchasing and the performance of the SCOR model. *Total Quality Management & Business Excellence*, 21(12), 1261-1278.
- Kayode, D.J., Yusoff, N.M., Veloo, A. (2016). Validating quality process management instrument for higher education using structural equation modelling. *International Journal for Quality Research*. 10(2). 341-354.
- Nestic, S., Stefanovic, M., Djordjevic, A., Arsovski, S., & Tadic, D. (2015). A model of the assessment and optimisation of production process quality using the fuzzy sets and genetic algorithm approach. *European J. Of Industrial Engineering*, 9(1), 77. <http://dx.doi.org/10.1504/ejie.2015.067453>
- Palmberg, K. (2010). Experiences of implementing process management: a multiple-case study. *Business Process Management Journal*, 16(1), 93-113.

- Řepa, V. (2011). Role of the Concept of Service in Business Process Management. *Information Systems Development*. New York: Springer, LNCS. 623–634
- Řepa, V. (2012). *Information Modelling of Organizations*. Prague: Bruckner
- Řepa, V., Závadská, Z. & Závadský, J. (2013). *CEABPM 1001:2013. Requirements for the Process Based Organizations*. Poprad: Research Institute of Economics and Management
- Su Mi Dahlgaard-Park, S.M., Chen, Ch.K, Jang, J.Y. & Dahlgaard, J.J. (2013). Diagnosing and prognosticating the quality movement – a review on the 25 years quality literature (1987–2011). *Total Quality Management & Business Excellence*, 24(1-2), 1-18.
- Veselovská, L., Závadský, J. & Závadská, Z. (2015). Performance indicators of the logistic processes and its consistent definition in the selected manufacturing company. In *Carpathian Logistics Congress 2015*. Jeseník: TANGER, Ltd.
- Wooluru, Y., Swamy, D.R. & Nagesh P. (2014). The process capability analysis – tool for process performance measures and metrics – A case study. *International Journal for Quality Research*, 8(3), 399–416.
- Závadská, Z. (2013). Audit of the process-based management system. *Výkonnosť podniku*. 3(1), 6–15.
- Závadský, J. & Hiadlovský, V. (2014). The consistency of performance management system based on attributes of the performance indicator: An empirical study. *Quality Innovation Prosperity*, 18(1), 93-106.

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