THE EVALUATION FRAMEWORK FOR BUSINESS PROCESS MANAGEMENT METHODOLOGIES

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In an intense competition in the global market, organisations seek to take advantage of all their internal and external potentials, advantages, and resources. It has been found that, in addition to competitive products and services, a good business also requires an effective management of business processes, which is the discipline of the business process management (BPM). The introduction of the BPM in the organisation requires a thoughtful selection of an appropriate methodological approach, since the latter will formalize activities, products, applications and other efforts of the organisation in this field. Despite many technology-driven solutions of software companies, recommendations of consulting companies, techniques, good practices and tools, the decision on what methodology to choose is anything but simple. The aim of this article is to simplify the adoption of such decisions by building a framework for the evaluation of BPM methodologies according to a qualitative multi-attribute decision-making method. The framework defines a hierarchical decision-making model, formalizes the decision-making process and thus contributes significantly to an independent, credible final decision that is the most appropriate for a specific organisation.

Keywords: Business Process Management, evaluation framework, methodology.

1. INTRODUCTION

Organisations are increasingly aware of the meaning of a comprehensive treatment and management of their business processes. This is due to an intense competition in the global market, where only the best, the leading companies in

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various industries can survive in the long term. Awareness of importance of the business processes has slowly, but steadily increased in developed economies from the mid-eighties, when Porter defined the concept of a value chain. In addition, all contemporary organizational structure, more or less, emphasize the role of business processes (Harmon, 2014). Business process management is becoming an important part of organisations' operational business, as well as of many new projects for performance improvement.

Smith and Fingar (2003) divide the history of business processes into three eras or waves. The first started at the beginning of 20th century, when Fredrick Taylor proposed a theory of management, wherein we find the origin of the modern BPM discipline under "Methods and procedures analysis". The second wave reached its peak with the business process reengineering movement in mid-1990s (Davenport, 1992; Hammer & Champy, 1993), whereas the third wave, which started at the beginning of the 21th century, represents maturation and synthesis of previous methods and techniques in the area of business processes joined into a single entity, whereby the whole field became known as BPM.

Jeston and Nelis (2013) define the BPM as achieving goals of an organisation through improvement, management, and control of essential business processes. The definition given by Harmon (Harmon, 2014) also coincides with the previous one, as it defines the BPM as a management discipline that focuses on improving an organisation`s efficiency by managing its business processes. The last but not least, the Association of BPM professionals defines the concept of the BPM as a management discipline that integrates strategy and objectives of an organisation with expectations and requirements of clients by focusing on comprehensive business processes (Benedict et al, 2013). The definition of the BPM itself indicates that this is a complex discipline that covers strategy, goals, culture, roles, policies, methodologies and tools for analysis, planning, implementation, control, constant improvement and management of comprehensive business processes.

This article deals with the problem of selecting an appropriate methodological approach to BPM in organisations. Despite of many technology-oriented approaches of individual manufacturers (Oracle, IBM, etc.) that imply the use of a particular BPM software in advance, analytical approaches of consulting companies that are wrapped in mystery (Gartner, Deloitte, etc.) and plenty of recommendations, techniques and methods that we can find in professional literature, the decision on what methodology to choose is anything but simple. The purpose of this article is to design a framework for

evaluation of BPM methodologies with the use of a multi-attribute decision-making model.

The article begins with the definition of the BPM methodology and a brief overview of today`s popular approaches, with particular attention to comprehensive, freely accessible methodologies. In the field review we are dealing with existing methods for evaluating methodologies, techniques, and tools for BPM, in the methodology section we explain the reasons for selecting the DEX method as the basis for the framework. The main part of the article is dedicated to the design of the framework which includes the definition of elementary parameters according to dimensions, combining parameters in hierarchical structure, and defining domains and aggregate functions. In the conclusion, we use the proposed framework for the evaluation of 7FE BPM and BPTrends methodologies and analysis of their advantages and disadvantages.

2. LITERATURE REVIEW

2.1. BPM Methodologies

Harmon (Harmon, 2008) defines methodology as a comprehensive and specific set of instructions to carry out certain tasks, and in the case of the BPM it is a redesign or improvement of business processes. Swet (Swet, 2014) defines the BPM methodology as an approach with principles and specific procedures, which provides guidelines on how to tackle different scenarios within the BPM discipline. He also emphasizes that the methodology should not be seen as an algorithm, but more as a set of good practices, recommendations, techniques, specific approaches, unified vocabulary and a set of tools that can be used in BPM projects. Filipowska (Filipowska et al, 2009) agrees with him, since she believes that we should regard the methodology as a guidance, a checklist of activities on a project rather that as a strict sequence of steps.

We distinguish between freely accessible methodologies (described in professional and scientific literature) and companies' internal methodologies that are not available to the general public. BPM methodologies can be classified into three basic categories (Harmon & Wolf, 2014): top-down, focusing on the implementation of large-scale improvements on the level of an organisation as a whole (Rummler-Brache, BPTrends, etc.); bottom-top, whose main objective is a gradual improvement of individual activities and business processes (6 sigma, lean 6 sigma, etc.); and methodologies in the field of information technology that are focusing on the automation and

computerization of small and medium-sized processes (RUP, ARIS, IDEF, etc.).

The research (Harmon & Wolf, 2014) showed that organisations today mostly use a bottom-up approach (48%), which means that they are implementing their own or generally recognized methodologies for a continuous improvement of business processes, while a top-down approach is used only by a quarter of organisations (23%). It is also interesting to note that nearly half of all organisations dealing with the BPM use their own methodology for this purpose. Since BPM is a large and fast-growing management discipline, it is no surprise that in 2013 only 32% of organisations used a unified methodological approach, while one third of organisations is aware of the importance of a unified approach and is seriously considering it (Harmon & Wolf, 2014).

Organisations that are primarily focusing on a continuous improvement of individual business processes mostly use one of the variants of the approach that was founded by Deming in the 50s, which includes a cyclical repetition of activities of planning, implementing, checking and taking actions (PDCA – Plan, Do, Check, Act), and which includes the following steps: establishing a review of fields that are the subject of improvement, collecting stakeholders' requirements and establishing priorities, making a model of the existing process (as is), making a model of a renewed process (to-be) and implementing the revised process (Jeston & Nelis, 2013). The literature reveals a series of BPM methodologies that are based on the PDCA cycle (Benedict, 2013; de Morais et al, 2014, etc.). An extensive review of professional and scientific literature in the field of the BPM and a comparison of seven selected methodologies (de Morais et al, 2014) with a general approach, drawn up by the Association of Business Process Management Professionals - ABPMP), showed a lack of emphasis on an organisation`s strategy and process architecture. For this purpose, de Morais defines his own framework as an upgrade of the classic PDCA cycle by introducing additional, strategic phases that take care of a close interconnection between an organization`s strategy and initiatives in the field of the BPM. A division of BPM methodology into activities dealing with general operations at the level of an organisation (e.g. strategy) and activities relating to individual business processes is also supported by Weske (2007) and Harmon (2014).

Due to the changes in the focus of organisations in 21st century (the focus is shifting from dealing with individual business processes to the development of large-scale business processes architectures at the level of organisation as a whole and to the implementation of comprehensive, corporate business process

management systems), the integrated top-down approaches to BPM are being increasingly established. Their most important freely accessible representatives are BPTrends methodologies (Harmon, 2014), 7FE BPM (Jeston & Nelis, 2013), and Rummler-Brache (Rummler & Brache, 2013). The BPTrends methodology provides two distinct BPM methodologies: for the construction of business process architecture and for redesigning business processes. The objective of the first methodology is to provide management tools for all activities of an organisation in the field of the BPM, where this is not all about the implementation of individual projects but more about continuous management of efforts, directed towards the process approach to business. The BPTrends business processes redesign methodology enables the implementation of a BPM project that includes understanding the project, process analysis, redesign, implementation and roll-out. The Rummler-Brache methodology emphasizes the performance aspect of the BPM and is based on the performance framework which identifies nine performance variables at three levels (organisation, process, and activity) in terms of three needs (goals, design and implementation and management). Mature organisations should be consistent in both vertical and horizontal axis of the performance framework, which means that each BPM initiative has to be examined from all angles (performance variables), because only this approach provides an optimal solution to the problem.

Also interesting are approaches suggested by Damij et al (2008) and Siha and Saad (2008). The first case is the TAD methodology (Tabular Application Development), which aims at bridging the gap between business modelling and information systems development, which is neglected by other methodologies; the second case is the SAM methodology (Specify, Analyze, Monitor) whose main purpose is to provide organisations with an adequate response to external changes (changes in markets, new customers' requirements) and internal problems (inefficiency). In addition to general methodologies for BPM, methodologies for individual types of organisation are also being established. Thus, for example, Štemberger and Jaklič (2007) define the methodology for the renewal of business processes in the public sector, where they specify in detail all the necessary phases, activities, techniques and tools.

Ideas on using agile approaches and principles acquired from agile methodologies for software development are increasing in number, also for the needs of BPM projects (Meziani & Magalhães, 2009; Thiemich & Puhlmann, 2013; Logimethods 2014; Virtusa Coorporation, 2014). According to their authors, agile BPM methodologies provide an early realization of benefits, accelerate the implementation of BPM knowledge in organisations and reduce

the financial risk, because they are introducing shorter (e.g. 30-day) iterations between releases of process and simultaneously implement the BPM stages of process planning, modelling, and implementation. With agile approaches, there is a question of a broader coordination between an organisation as a whole and its strategy, because there is a risk of excessive focus on quick wins, while neglecting or overlooking a broader context.

2.2. Evaluation of BPM methodologies

Current scientific literature presents numerous approaches for assessing the usability of the BPM tools, mostly analytical tools for modelling and simulation as well as complete BPM systems ('software suites') (Koster et al, 2009; Johansson et al, 2012; Filipowska et al, 2009). Thus, analytical companies and organisations, such as Forrester, Gartner and OVUM in their annual reports provide evaluations of the BPM systems provided by different manufacturers (e.g. Gartner`s Magic Quadrant for BPM Suites). A number of scientific articles (Koster et al, 2009; Kannengiesser, 2007; Hahn et al, 2012; Miers, Harmon, 2005; Bosilj-Vuksić et al, 2007) deal with defining frameworks for evaluating the BPM tools. On the other hand, there are only a few articles in the field of evaluating the BPM techniques (e.g. techniques for business processes improvement, renovation, modelling) (Johansson et al, 2012; Griesberger et al, 2011) and the BPM methodologies (Kettinger et al, 1997; de Morais et al, 2014; Filipowska et al, 2009).

In his extensive research, Kettinger analyses 25 BPM methodologies of various consulting companies, their approaches, techniques and tools. Based on an inductive approach he builds a composite BPM methodology called Stage-Activity (S-A) framework with six main stages (Envision, Initiate, Diagnose, Redesign, Reconstruct and Evaluate) (Kettinger et al, 1997). Each stage is further divided into several activities, whereby Kettinger proposes the appropriate techniques and tools for their execution. Thus, S-A framework represents a methodology archetype, which can be used in BPM project planning as a basis for the development of own methodological approaches, adapted to individual projects. The S-A framework alone is not directly intended to represent an assessment tool for the existing BPM technologies, yet it may be used as such indirectly, by comparing activities and techniques of the sample S-A framework with a specific BPM methodology.

De Morais et al (2014) use a general approach of the ABPMP organisation as a foundation for comparing BPM methodologies, whereby the comparison is limited to the identification of the individual phases of each evaluated BPM

methodology by phases recommended by the ABPMP organisation. This evaluation method of BPM methodologies does not go into details and does not define the evaluation criteria; it only offers general guidelines about the phases and activities that a good BPM methodology should include. Furthermore, it does not deal with the evaluation of integrity, quality of presentation, or usability of BPM methodologies.

The most direct approach to evaluate BPM methodologies is introduced by Filipowska et al (2009). They combine evaluation criteria in three dimensions: the purpose of methodology, structure, and quality. The "purpose" evaluates reasons for the application of the BPM methodology, the dimension "structure" gives an assessment of whether the methodology is adopted to the studied problem area, and the dimension "quality" gives a general assessment of its quality. This approach has a number of important problems that hinder its use in practice. It is difficult to provide independent, credible estimates for many criteria (motivation, simplicity of application, correctness of assumptions, etc.), which increases the degree of uncertainty and risk, and ultimately it can lead to a completely incorrect result. The overall estimate is based on a balanced sum of normalised estimates of all criteria included in the method, whereby weights are not predefined but their distribution is in the domain of the evaluators themselves.

This approach places great responsibility on the assessor, since the definition of weights (aggregate functions) is one of the most important activities in each decision-making process. An inadequate distribution of weights (e.g. due to incorrect estimates, lack of knowledge, inexperience, etc.) can result in an incorrect final estimate of the variants and thus inappropriate selection. Finally, the approach proposed by Filipowska does not deal with the presence of key elements that should be included in the methodology and that should ensure a successful implementation of projects in the field of the BPM (there is a criterion called the "domain support", which is general and does not imply what the domain, such as a BPM example, should include).

The shortcomings of the aforementioned approaches for evaluating BPM methodologies require the development of a new evaluation framework with clearly defined criteria regarding both the content as well as the structural point-of-view. Only a comprehensive framework, based on the identified key success factors of BPM projects, and supported by an appropriate tool, will allow the BPM project planners to create an unbiased evaluation of the various BPM methodologies and to select the most appropriate one.

3. RESEARCH METHODOLOGY

Selecting the most appropriate BPM methodology is one of the most important decisions to be made by the organization prior to the execution of complex projects in the field of BPM. The decision support, which is part of the interdisciplinary area of scientific decision-making and includes several specialized scientific and technical areas (operational research, decision analysis, decision support systems, etc.), deals with the issue of improving the decision-making process. The basic components of each decision-making process (Bohanc, 2014) comprise decision-making problem, alternatives, preferences and preference relations, goals and consequences, parameters, attributes and criteria, as well as uncertainty and risk.

The decision on which BPM methodology to adopt at the strategic level of the organization ranks among the most difficult decisions and is usually subject to collective decision-making. Consequently, this increases the degree of risk in such a decision-making process, especially if the decision-makers do not rely on the use of a structured approach supported by the decision model. Complex decisions are influenced by many factors; we are dealing with multiple-attribute decision criteria (Keeney & Raiffa, 1993), whereby the individual parameters are arranged into different hierarchical levels to manage the complexity of the decision making.

With the aim to reduce the level of risk when deciding on the selection of appropriate BPM methodology, we have built our own evaluation framework that uses a hierarchical multi-attribute model for the assessment of individual alternatives. Basic elements of the model are parameters or variables that can be observed, measurement scales that define the domain, the hierarchy of parameters and aggregate functions that define aggregation of partial assessments of alternatives in the total assessment (Bohanec et al, 2013). Although the parameters of the previously presented method for the evaluation of BPM methodologies (Filipowska et al, 2009) are hierarchically arranged, the mere use of the balanced sum as an aggregate function in all three dimensions indicates that this is a typical example of a linearly structured decision-making model, whose main weakness is the restriction to decision-making problems with small number of parameters. The restriction is resolved with the use of a hierarchical model, in which we arrange parameters in several levels (in a tree). The leaves of the tree represent input parameters of the evaluation model, and nodes represent derived parameters, where the root of the tree is the main output parameter that specifies the final evaluation of each alternative.

There are many methods for a hierarchical multi-attribute evaluation, which are roughly divided into quantitative (AHP, MAUT type method, etc.) and qualitative (DRSA, DEX, etc.). Unlike quantitative methods, in which parameters (input and output) are continuous (numeric) variables and aggregate functions are usually in the form of a balanced sum, qualitative methods use symbolic parameters with a predetermined domain and aggregate functions are defined as tables with if-then rules. An established representative of the latter is the DEX method (Decision EXpert) (Bohanc & Rajkovič, 1990). The symbolic expression used in DEX is most appropriate in decision-making situations, where non numeric parameters prevail and where the emphasis is on a subjective assessment. In addition, aggregate functions in the DEX method are not linear in general, because they are determined by if-then rules, which allow them a more free definition. The DEX method is less sensitive (more alternatives can be evaluated with the same final assessment) than the comparable quantitative methods, which has to be taken into consideration in its application (Bohanc, 2012). Because of these characteristics we selected the DEX method as the basic tool in building the BPM methodologies evaluation framework. We can assume that such decision-making problems primarily include qualitative parameters and the decision-making is mostly subjective, a maximum flexibility (non-linearity) is required for aggregate functions, and the problem of low sensibility will be resolved by a more detailed analysis of results of individual alternatives at different hierarchical levels of the model.

4. EVALUATION FRAMEWORK

When building a framework, we first encounter the question of which parameters to include. Parameters shall meet the following requirements (Bohanec, 2012): completeness (considering all essential parameters that affect the result of the evaluation), non-redundancy (there should not be any unnecessary parameters that do not affect the evaluation), mutual independence or orthogonallity (each important decision-making factor is represented only by one parameter) and operability (usefulness in practice or the ability of understandable definition and clarification). We began structuring the model by combining top-down and bottom-up approaches. Thus, we first defined the final evaluation of alternatives, which is the result of combining two dimensions (content and structure of the methodology), followed by the definition of basic parameters of both dimensions and integration of related parameters into higher hierarchical levels. Here we considered the recommendations of the DEX method authors (Bohanec, 2012), who recommend the definition of the order in the parameters domain from bad to good and the restriction of the parameter domain (using only a few different values to distinguish between significantly

different values of the studied alternative), where the latter increases from lower to higher-ranking parameters.

4.1. "Methodology Content" dimension

The "methodology content" dimension includes criteria that specify the content level of key elements (factors) for a successful implementation of the BPM at the level of an organisation as a whole, individual business processes management, implementation of projects and finally, the project management itself. Jurisch (Jurisch et al, 2014) statistically demonstrates that the implementation of project management, change management, and an effective use of information technology affect a successful change of business processes in an organisation. Based on experiences Burlton (2014) highlights the importance of coordinating BPM projects with the strategy of an organisation, the involvement of all stakeholders (customers, staff, suppliers, buyers, etc.), the construction of a consistent process architecture, the use of appropriate framework for BPM, the commitment to fundamental principles of the BPM, mutual communication, cooperation and finally, the use of a comprehensive BPM methodology.

BPM practitioners Jeston and Nelis (2013) also came to similar findings; they underline the importance of management supports, an experienced BPM manager, people change management, setting up a system for measuring performance, a sustainable implementation and finally, realization of the business value for an organisation. On the basis of a case study, Trkman (2010) confirms preliminary findings and emphasizes the following key BPM success factors: a change in the organizational form and the introduction of the BPM department, introduction of a system for continuous processes improvements, standardization, process computerization and automation and education of employees. Finally, Rosemann and vom Brocke (2010) define a framework that combines and structures essential BPM factors and proposes six key elements important for the BPM: strategic alignment, management, information technology, people, and culture.

It is important that BPM methodologies address as many factors described above and in this way provide the widest possible range of activities, products, and tools for their treatment. Based on the study of the literature presented in the previous chapter, which deals with the scope of the BPM key success factors, we were able to Identity nine elementary parameters and the "methodology content" dimension for the evaluation of individual BPM areas, combined into three categories according to their placement at an appropriate

level (organization as a whole, individual business processes and implementation). Table 1 shows parameters of the "methodology content" dimension.

Table 1. Parameters of the "methodology content" dimension

Organisation	• Organisation`s strategy: how methodology supports the definition of an organisation`s strategy, its communication at a lower level, alignment of business processes and strategy. • Process architecture: support for building processes decomposition at the highest level, the use of reference models, the definition of ownership and measures. • Organizational form: how solutions for changes in the organization form (matrix, process) are discussed and the establishment of formal organisational forms for BPM (departments, service).
Business processes	• Business processes renovation: what approaches, methods, techniques and tools the methodology suggests for the renewal of business processes. • Continuous improvement: how the methodology deals with activities following the completion of processes renovation projects, does it provide their robust implementation and continuous improvement. • Performance measurement: how the methodology addresses the establishment of a system for measuring performance.
Implementation	• People: are procedures for defining tasks included, does the methodology include people change management, are communication and cooperation mechanisms defined, to what extent is the need for education emphasized. • Technology: are procedures for the implementation of solutions in the IT field included, how are delimitations and interactions between business and IT activities realized, to what extent does the methodology rely on IT tools. • Management: does the methodology include elements of project management, how is change management discussed, are the procedures of organising working groups defined.

4.2. "Methodology Structure" dimension

This dimension provides an assessment of the structure of the methodology, its integrity, and the quality of presentation. In the past, various types of approaches (structural, process, object, agile) were created especially in the field of information systems development methodologies. Avison (1995) defines the methodology as a set of procedures, techniques, tools and

documentations; Cockburn (2002) defines 13 constructs of methodology (activities, products, techniques, tools, roles, knowledge, standards, etc.); the OPF framework (OPEN Process Framework) includes the following components: product, manufacturer, work unit, language and phase (Firesmith, 2004); the method engineering discipline defines a method fragment as a consistent and well-defined part of methods which can be viewed from the perspective of process or product (Brinkkemper et al, 1999).

In accordance with the above, the structure of the BPM methodology must properly organise all elements in a comprehensive, coherent whole that provides procedural integrity, appropriate techniques and tools and relies as much as possible on the established approaches and standards. Of course, the content of the methodology, as well as the incorporated examples, should be presented in the highest quality, concise, consistent and understandable way. But all this is not of much help, if the methodology has limited usability due to poor flexibility, inability to adapt to specific circumstances, or simply its concept was not sufficiently verified on specific BPM projects. Table 2 shows parameters of the "methodology structure" dimension.

Table 2. Parameters of the "methodology structure" dimension

Integrity and support	• Procedural integrity: does the methodology support all the necessary steps, include smooth transitions between activities, adequately specify inputs and outputs (products), are the procedures consistently initiated and completed. • Techniques and tools: are techniques and tools for the implementation of individual activities specified and with how much detail. • Standards compatibility: is the methodology based on the existing standards, does it include standardized techniques and languages, does it complement and upgrade standards.
Quality of presenting	• Description quality: how is the methodology described, is the content concise, consistent, and understandable. • Examples availability: does the methodology support a theory with practical examples of use, how detailed are descriptions of examples, are they understandable and consistent.
Usability	• Flexibility: is it possible to use it in different scenarios, does it focus on a narrow or a broader domain area. • Verified: how many organisations use this methodology, was it verified on several projects. • Adaptation options: what are the possibilities of adapting it to specific organizational and project circumstances, is it possible to expand or simplify the methodology.

4.3. Evaluation model

Figure 1 shows a multi-attribute decision-making model for evaluating BPM methodologies according to the DEX method with included two dimensions: the content and the structure of the BPM methodology. The parameters are organized into four hierarchical levels, where domains of parameters at lower levels include three possible values (poor, medium, and good), at higher levels four (poor, satisfactory, medium, good) and in the root five values (poor, satisfactory, medium, good, excellent), which is consistent with the recommendations of the DEX method. Aggregate functions are specified in tables using the if-then rules.

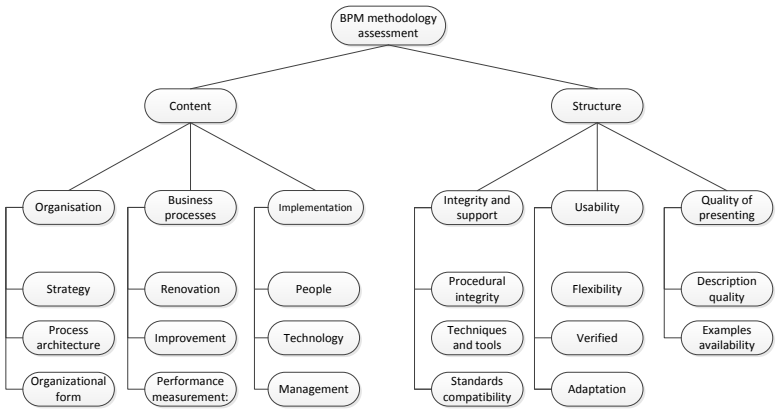

Figure 1. Evaluation model

Figure 2 shows the example of such function at the highest level (for parameter BPM methodology assessment). To build the model, we used a freely accessible tool for qualitative multi-attribute decision-making modelling - DEXi.

	Content	Structure	BPM methodology assessment
	50%	50%	
1	poor	<=satisfactory	poor
2	<=satisfactory	poor	poor
3	poor	>=medium	satisfactory
4	satisfactory	satisfactory	satisfactory
5	>=medium	poor	satisfactory
6	satisfactory	>=medium	medium
7	satisfactory:medium	medium	medium
8	medium	satisfactory:medium	medium
9	>=medium	satisfactory	medium
10	medium	*good*	good
11	*good*	medium	good
12	*good*	*good*	*excellent*

Figure 2. Decision-making rules table of the parameter "BPM methodology assessment"

4.4. Evaluation process

The BPM methodologies evaluation framework defines the following steps in the evaluation process: identification of alternatives, evaluation, analysis and the final selection of an alternative. Prior to the evaluation process, it is necessary to assemble a team that will carry out the evaluation. The team consists of people of various profiles, such as experts in the BPM and information technology, organisation managers and business analysts. We begin the evaluation process by defining alternatives (BPM methodologies) that will be the subject of the evaluation. When identifying alternatives we should know whether or not we would be able to obtain all the information for each alternative that are necessary for credible estimates for all parameters included in the framework. This is the only way to avoid the uncertainty of the estimates and indirectly reduce the possibility of an incorrect final result of the evaluation.

In the evaluation stage, we determine an estimate for each input parameter, whereby this estimate is a synthesis of estimates of all people involved. This is definitely the most important and most difficult step in the evaluation process, since participants have often conflicting views, which requires a lot of mutual understanding, explaining, and cooperation. The job of the team leader is to properly navigate between different views and interests, and in the end, combine participants' opinions in a commonly acceptable final estimate of each parameter. The final estimate of each alternative is the result of the synthesis of individual parameters estimation in accordance with aggregate functions defined in the framework.
In the analysis stage, we carry out a detailed analysis of the final estimate and determine on what basis the estimate was obtained, whether it is appropriate, how it is affected by any changes in parameter estimates (what-if analysis) and finally, what the advantages and disadvantages of each alternative are. In the last stage, we reconsider all the results one more time, and if we are satisfied with the results, we finally select one of the given alternatives.

5. 7FE BPM AND BPTrends METHODOLOGY EVALUATION

Two approaches to BPM are presented in detail and evaluated: 7FE BPM framework (Jeston & Nelis, 2013) and BPTrends methodology (Harmon, 2014). Our reasons to select and present these two methodologies are as follows: they both use the top-down approach, which we consider crucial for the overall management of business processes within the organization at all levels; they are both based on years of experience in the field of BPM; the value of these methodologies is confirmed by a number of successful BPM projects; both are

freely available and described in more detail than the others; and last but not least, they are completely technology-independent. The evaluation of both approaches was conducted by a group of experts, which included experts in the fields of BPM and IT, implementing the four-stage approach described in the previous chapter.

The 7FE BPM framework (Jeston & Nelis, 2013) is based on four, according to the authors, key BPM aspects: business processes, people, technology and project management. The framework consists of ten stages (strategy, process architecture, initiation, understanding, innovation, development, implementation, value realization, and sustainable performance), to which are added three foundations: project management, people change management and leadership. In the image 3, which represents evaluation results of the 7FE BOM framework with the use of the decision-making model, we can see that the framework was evaluated as a "good methodology".

A detailed analysis of the results by dimensions shows that the 7FE BPM framework received good evaluations in most parameters, deficiencies were mainly found in the "methodology content" dimension in the field of organisation`s strategy definition and alignment, process architecture construction, continuous processes improvement, the establishment of performance measurement system and integration of technologies. It is these shortcomings that have prevented an excellent final assessment of the framework. In the future, the authors of the framework will need to devote extra attention to those areas, if they want to adequately support all key success factors of the BPM.

On the other hand, we can see that the methodology structure itself is exemplary, procedures are comprehensive, precise and clearly structured, transmissions between activities are consistent, inputs and outputs are clearly defined, a wide range of techniques and tools is included, the methodology is flexible and proven on numerous BPM projects, the content is of a high quality, examples are well-described. It would be good to further increase compliance with standards and in particular, to better define guidance and recommendations for adapting this methodology to specific organisation's circumstances. Organisations rarely implement the entire methodology. , A certain level of adaptation to the characteristics of an organisation itself and of individual projects is usually necessary. The framework gives two possible approaches: strategically managed (top-down) and operationally initiated (bottom-up) and identifies four possible scenarios (project types), but the details are not sufficiently elaborated for efficient use in practice.

The final assessment of the 7FE BPM framework is that it is extremely suitable for implementation in all organisations that want to manage their business process at all organizational levels, both through the use of strategically as well as operationally guided approach. Detected limitations of the framework, which relate primarily to inadequate treatment of individual BPM areas, can be overcome by extending it by introducing additional procedures and techniques for strategic planning, process architecture construction, continuous improvement and performance measurement.

The BPTrends methodology (Harmon, 2014) proposes two separate methodologies for BPM: one for the construction of process architecture and one for the improvement of business processes. The objective of the former method is to provide tools for organizing and managing all activities of an organization in the field of BPM, and includes activities for familiarizing with the organization's operations, identification of processes at the organizational level (process architecture), performance criteria, process ownership and adaptation of architecture. All activities are closely linked to the established business strategy of the organization. BPTrends redesign process methodology assumes a process redesign BPM project that takes place in five phases: understand project, analyze business process, redesign business process, implement and roll-out redesigned business process.

The BPTrends methodology has received an excellent overall evaluation (Figure 3), as both dimensions proved to be well supported. The advantages of this methodology have proved particularly successful on the highest organizational level of business processes, as the methodology addresses a number of techniques and tools for the preparation and maintenance of the organization's strategy and its alignment with business processes at lower levels. The BPTrends methodology also focuses on the issue of business process measurement and presents various possible ways of measuring performance at all levels of organization, including the use of established reference models (SCOR, VRM, etc.). In comparison with the 7FE BPM model, the implementation activities are less well described yet it was still evaluated as "medium". Although the "structure" section of the BPTrends methodology was also evaluated as "good", a more detailed analysis shows that the 7FE BPM framework is better in this regard due to a more thorough, quality and comprehensive description of procedures. In the "adaptation" section, the BPTrends methodology was evaluated as "poor" (see Figure 3), as the methodology does not explicitly address this area.

Evaluation results

Attribute	7FE BPM	BPTRends
BPM methodology assessment	good	*excellent*
Content	medium	*good*
Organisation	medium	*good*
Strategy	medium	*good*
Process architecture	medium	*good*
Organizational form	*good*	medium
Business processes	medium	*good*
Renovation	*good*	*good*
Improvement	medium	medium
Performance measurement	medium	*good*
Implementation	*good*	medium
People	*good*	medium
Technology	medium	medium
Management	*good*	medium
Structure	*good*	*good*
Integrity and support	*good*	*good*
Procedural integrity	*good*	medium
Techniques and tools	*good*	*good*
Standards compatibility	medium	*good*
Usability	*good*	medium
Flexibility	*good*	*good*
Verified	*good*	*good*
Adaptation	medium	poor
Quality of presenting	*good*	*good*
Desciption quality	*good*	medium
Examples availability	*good*	*good*

Figure 3. Results of the 7FE BPM framework and BPTRends methodology evaluation

The criteria factors, which are indirectly defined in the model through decision-making rules for the "usability" parameter received "medium" evaluation due to good ratings in the "flexibility" and "verified" criteria, despite the negative evaluation in the "adaptation" parameter.

A comparison of two generally accepted methodologies for BPM by using a decision-making model with multiple parameters shows that both methodologies are largely successful in addressing the most important aspects of BPM, with some differences mostly relating to motivation, theoretical background and experience of their respective authors. Thus, the BPTrends methodology seeks to act as a general purpose framework, easily adaptable to include other standards and techniques in the field of BPM, while the 7FE BPM framework gives an accurate, detailed approach for the implementation of BPM projects.

6. DISCUSSION AND FUTURE RESEARCH

In this article, we defined the framework for BPM methodologies evaluation using the DEX method and tested it in the evaluation of the 7FE BPM and BPTrends methodologies. Compared to other approaches (Kettinger et al, 1997, de Morais et al, 2014, Filipowska et al, 2009), its most important

advantages are: it directly specifies a set of hierarchical qualitative criteria and decision-making rules united in the BPM methodology evaluation model; it is based on a set of key success factors, which affect the success rate of BPM projects; the approach is not limited to the contents of methodologies (activities, products, etc.) but also includes an analysis of their structure (integrity, quality of presentation and usability); and last but not least, it is directly supported DEXi tool, which enables the reviewers to quickly and efficiently test different variants (BPM methodologies) and implement detailed what-if analyzes. The framework also includes a well-defined evaluation process that leads the reviewers – experts from various fields (BPM, IT, strategic, tactical and project managers) – from the initial identification of alternatives, through the evaluation and analysis of the results, to the final selection of the most appropriate alternative. Primarily, the framework is intended for the evaluation of general BPM methodologies introduced at the level of an organization as a whole, which provide foundations (consistency with the strategy of the organization, process architecture, etc.) for a comprehensive and controlled implementation of all projects in the field of BPM. Here, we should be aware of the restrictions of the framework, which primarily derive from the fact that we were focused on a comprehensive treatment of the BPM, which implicitly favours general top-down approaches and puts in the second plan operationally oriented methodologies such as 6 sigma and lean approach which are, according to the research, still most commonly used. In manufacturing companies in particular, where these methodologies proved to be very effective in business processes improvement, the solution lies in their integration with the general, strategically-oriented approaches, which ultimately provides consistency of an organisation both from horizontal as well as from vertical perspective.

Another restriction of the framework is related to the fact that – like other approaches for evaluating BPM methodologies – it does not directly address the specific situations of individual organizations and projects. When introducing a new methodology into an organization, we are always confronted with the existing situation, which affects the selection of methodology and its adaptation to a greater or lesser extent. The existing situation, together with the set of objectives, presents the starting point for the initial specification of requirements that the prospective BPM methodology should meet. The problem arises because our general framework already defines decision-making rules at all hierarchical levels, and thus directly determines the factors of individual criteria (ignores the specification requirements of a particular project). The solution lies in adjusting the framework of decision-making rules in accordance with the specified requirements prior to the evaluation. If, for example, the requirement for a BPM methodology with clear guidelines, techniques and tools

is set at the very beginning, the decision-making rules should be set in such a way that the methodologies with "poor" ratings are automatically excluded from the selection (consequently, the BPTrends methodology would receive "poor" rating instead of "excellent"). Certainly, such an approach requires more initial preparations and coordination, but it is necessary for achieving a credible final assessment adapted to an individual organization.

Testing of the proposed framework has been implemented only on a theoretical level, in two acclaimed BPM methodologies, without direct verification on specific organizations or projects, which (to some extent) limits the ability of delivering independent final evaluation of its usefulness in the real situations. Only further practical application will be able to make a completely realistic assessment of the framework strengths and weaknesses, as well as opportunities for improvement. In the near future, we are planning to test the framework by selecting BPM methodologies for several large Slovenian companies that wish to take their business process management to a higher level. The acquired experiences and feedback will assist us in improving the very foundations of the framework as well as in defining the adaptation processes for various circumstances that are present in organizations and projects. The ultimate aim of our study is to build a useful, tested, generally dedicated and flexible framework, which will aid organizations in the process of introducing BPM methodologies in their business.

7. CONCLUSIONS

In spite of the above-described limitations on the basis of existing experience, we have discovered that the framework has proven useful both in the evaluation, as well as in analysing the results obtained and can be used by organisations when selecting the most appropriate methodological approach for the BPM. Selecting a BPM technology is only the first step of an organisation in a long-term process of changing its business with a focus on business processes.

Each organisation needs to find its own way, which generally means an adaptation of the selected methodology to specific organizational and project circumstances. This is the area for the situation methods engineering discipline that will provide a foundation for further research of the authors of this article in the direction of building a component framework for situation methods engineering in the field of the BPM.

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EVALUACIJSKI OKVIR METODOLOGIJA MENADŽMENTA POSLOVNOG PROCESA

Sažetak

U visoko konkurentnom globalnom tržištu, organizacije žele iskoristiti sve unutarnje i vanjske potencijale, mogućnosti i resurse. Pokazalo se da je, uz kompetitivnost proizvoda i usluga, ključ uspješnog poslovanja i efektivno upravljanje poslovnim procesima (*business process management* - BPM). Uvođenje upravljanja poslovnim

procesima zahtijeva promišljen odabir odgovarajućeg metodološkog pristupa, s obzirom da će taj pristup formalizirati aktivnosti, proizvode, praksu i druge napore organizacije u ovom području. Unatoč mnogim tehnološkim rješenjima i prikladnim programskim paketima, preporukama konzultantskih tvrtki, tehnikama, primjerima dobre prakse i brojnim alatima, odluka o adekvatnoj metodologiji nije nimalo jednostavna. Cilj ovog rada je pojednostavniti donošenje ovakvih odluka, na temelju okvira za evaluaciju BPM metodologija prema kvalitativnoj, više-atributnoj metodi donošenja odluka. Okvir definira hijerarhijski model donošenja odluka, formalizira proces donošenja odluka i uvelike pridonosi nezavisnoj, vjerodostojnoj odluci o metodologiji, prikladnoj za specifičnu organizaciju.