

UTILIZATION LEVEL OF BUSINESS PROCESS MANAGEMENT IN CZECH ENTERPRISES – OBJECTIVES AND FACTORS

David Tuček, Michaela Hájková, Zuzana Tučková

Introduction

Business Process Management (BPM) is becoming a hot topic for the scientific community solving a variety of research in the field of BPM as well as for the business sector constantly dealing with problems resulting from dynamic changes in the market. A process approach, which is the basis of BPM, is often referred to as a philosophy that is the cornerstone of the work organization in the company and the foundation of all business operations and activities [11]. The process approach allows organizations to eliminate the biggest disadvantages of a traditional functional approach that can not be considered as an approach appropriately flexible for changes in the corporate environment, variety of procedures, or excessive substitution of workers.

The functional approach often leads to the ambiguous assignment of competences with regard to responsibility for the outcome of the process as a whole, because it does not perceive the process as a whole. The process as a whole often runs across all functional organizational structure. Where the process runs over the various departments of the company, this situation may cause problems in the transfer of results between individual activities. The purpose of the process approach [10] is to uncover the processes that are often covered by "non-functional" functional organizational structure, to clean them from activities that do not add value for the customer and bring them into focus. The benefits of business process management [11] are flexibility, the ability to flexibly respond to changing environmental demands and a greater degree of involvement of employees in business

performance. Process management primarily provides a new perspective on the importance of the activities and helps to better determine responsibility for their quality. The use of the process approach helps disrupt the traditional departmental structure of the company. Processes built into focus with a greater degree of involvement of employees in company performance and giving maximum attention to processes, which in most cases run across organizational structure, contribute to teamwork and improving corporate culture. Only with effective management of processes, enterprises can effectively manage, modify, improve efficiency, increase performance, identify and resist market risks.

The objective of business process management can be defined as [6] the development and optimization running of the organization to ensure effective, efficient and economical reaction to customer requirements. A process-driven company is focused on the outcome of its activities, or the added value for the customer who paid for them. This company is more flexible and able to respond more quickly to market changes and customer preferences.

BPM principles are applicable in the quaternary sector too [14].

First of all, in this article we should evaluate the reasons which lead enterprises to exploit elements of process management in their working practices. The aim of Process Management is to develop and to optimise the daily running of an enterprise in a way which defines these work-related procedures (i.e. processes) as a unified flow or cascade of activities throughout the enterprise, where for each and every process its inputs are clearly defined as are the outputs or results, and where

the associated responsibilities and personal responsibilities are assigned for each and every process or activity, while establishing a system for the measurement of the performance of these processes and tracking and evaluating each and every process [16].

These activities must be realised (i.e. implemented) such that:

- The quality of production will be maintained through given measurement parameters.
- All available resources shall be optimally exploited.
- All of the performance indices of the enterprise have been improved continuously throughout in line with previously agreed and known and measurable criteria [15].

The market forces of today's business processes development have begun to place an important emphasis on business process quality. Evidently, the quality of a business process model highly influences the deployed business process. This motivated several researchers to propose metrics to evaluate the quality of business process model.

In fact, the concept of quality metrics was initially introduced to examine software quality. According to [1], a quality metric is a quantitative scale and a method that can be used to determine the value taken by a characteristic of a software product. Exploiting the maturity of software quality metrics, several researchers adapted several metrics from the field of software engineering for business process models [3], [5].

The authors conducted extensive research aimed at the utilization level of business process management in Czech manufacturing companies in 2012. The research was focused on several aspects of business process management. In this research, aspects of BPM are understood with the meaning of managers' views and opinions on management of business processes (Business Process Management). The research specialized in the area of goals, factors, components, support, benefits of and barriers to process management. The authors explored the extent to which Czech manufacturing companies use business process management. The utilization level of BPM in Czech companies was determined by self-assessment of managers and according to the actual utilization of BPM components. The research has also clarified the goals and

procedures that are important for Czech companies in the use of BPM components and found the extent to which the addressed companies use a software support of process management. Last but not least, the research also focused on identifying the benefits that the company achieved by BPM implementation and also on identifying barriers which the Czech companies faced in the BPM implementation. The results of the research, particularly the first part intent on the objectives and factors of BPM support, are the subject of this article. Part of the paper consists also in comparison of the results of previous research conducted in 2006 [9] and the current research. The comparison of these findings allows identifying trends of business process management in Czech companies for the past 6 years.

1. Objectives and Hypothesis Formulation

The main objective of conducted research and this paper is to provide a comprehensive overview of the utilization level of business process management and its individual components in Czech companies with focus on objectives that managers wish to achieve by BPM implementation and factors that are combined with a process-oriented company. Six hypotheses have been formulated to fulfil the main goal as shown in the following text:

- H1: The concept of Business Process Management is widespread in the Czech Republic.
- H2: The utilization level of business process management has increased in Czech companies since the previous research.
- H3: Managers of Czech companies do not understand interconnection of individual BPM components.
- H4: Managers of Czech companies do not focus on support processes.
- H5: The utilization rate of consulting services is not too high in Czech companies.
- H6: Managers of Czech companies do not perceive the BPM implementation as a strategic change.

2. Methodology of Data Collection and Subsequent Evaluation

The quantitative research was conducted through a questionnaire survey. The sample included manufacturing companies that have

more than 5 employees and their turnover was higher than 0 in 2011. A limit (5) on the minimum number of employees was determined based on the experience of previous survey implementation, which showed that small businesses do not use business process management or any of its components.

A sample of size of 320 firms was chosen at random. Return of questionnaires was 45 %. To minimize the risk of acquiring an insufficient number of completed questionnaires, at first, the authors addressed key employees of selected companies by phone and then the questionnaire was sent.

Tab. 1: Distribution of Respondents by Number of Employees

Characteristics of a company		Number of evaluated companies	
	Number of employees	Absolute frequency	Relative frequency
Micro companies	5–15	36	25 %
Small companies	15–50	20	13.89 %
Medium-sized companies	50–250	43	29.86 %
Large companies	250 and more	45	31.25 %
TOTAL		144	100 %

Source: own analysis based on [2]

The aim of this research was to explore attitudes, opinions and judgments of managers of Czech companies to individual aspects of business process management. A scaling method based on the principle of quantifying qualitative data was used in this research. The reason for this usage is that managers' responses involve subjective statements, which must be subsequently converted using a verbally, numerically or graphically expressed scale. Specifically the Likert scale method was used. Likert scales are used to indicate the degree (level) of agreement or disagreement with the specified statements, on which it is subsequently possible to deduce the attitudes and opinions of respondents [8]. Respondents expressed their agreement or disagreement with the given statements using a 5-point scale, where 1 expresses absolute disagreement and, conversely, 5 represents absolute agreement with the relevant statement. These values were subsequently converted to values 0–100 % or 0–1, where 0 represents absolute disagreement of respondents and 1 stands for absolute agreement. The calculated values of confidence intervals are quantified directly in charts.

In order to organize and arrange the findings obtained using a questionnaire survey and prepare data for statistical evaluation, Excel software was used. The actual statistical evaluation was carried out using JMP 10.

3. Research Results

3.1 Utilization Level of Business Process Management in Czech Companies

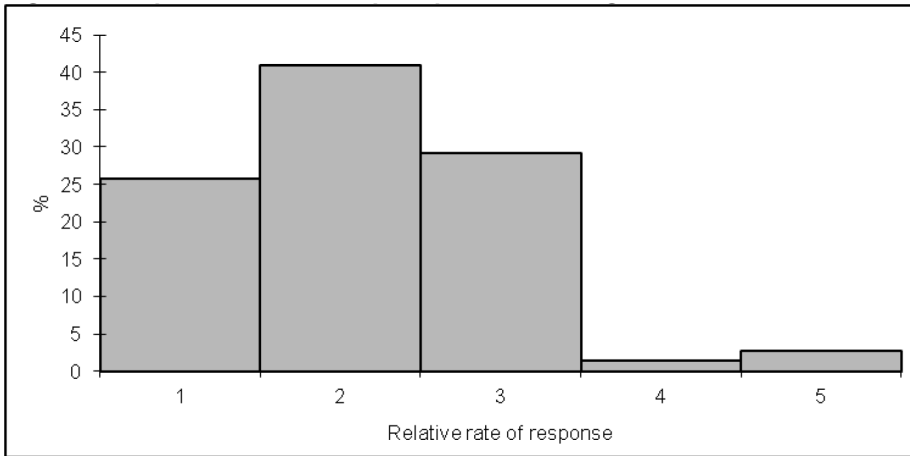
The following graph (see Fig.1) summarizes the achieved level of usage of process management in Czech enterprises. The table below the graph (see Table 2) contains a legend to the graph with the detailed results. There are also calculated confidence intervals (for reliability estimation of $1-\alpha = 0.95$) in the table. This question evaluates views of the interviewed managers of the importance of BPM to their company.

As has been already mentioned, the outcomes of the first question regarding BPM show utilization rates in our businesses in terms of managers' self-assessment. The results show that almost 41 % of Czech companies use business process management only partially (e.g. for a group of processes or only during activities such as process mapping, or only as a support for the certification of quality management system, etc.). In the context of the full use of process management, 29 % of Czech managers consider their company to be fully process-managed. The results which are presented in the graph (see Fig. 1) show that 26 % of respondents were completely unaware of the term process

management. The group of managers or companies that understand the concept of process management specifically includes only 1.4 % of all respondents. Among the responses

there were only answers that managers perceive BPM as part of the implementation of certification according to CSN EN ISO 9001:2009.

Fig. 1: Perception of the Concept of Process Management



Source: own analysis

Tab. 2: Legend to the Previous Graph with Quantified Confidence Intervals

Code	Utilization level	Number	Proportion of respondents	Lower interval	Upper interval
1	Unknown term	37	0.25694	0.192544	0.333976
2	Partial use	59	0.40972	0.332761	0.491375
3	Process-driven organization	42	0.29167	0.223613	0.370547
4	Specific understanding	2	0.01389	0.003817	0.049223
5	Unable to assess	4	0.02778	0.010854	0.069242

Confidence intervals (for reliability estimation of $1 - \alpha = 0.95$)

Source: own analysis

As can be seen from the following table (see Table 3), the answers to the question investigating the perception of the term Business Process Management by managers of Czech companies are also influenced to some extent by company size. The largest number of respondents who do not know the term business process management falls to a group of micro (61 %) and small enterprises (25 %). These two groups of enterprises also provide the lowest proportion in a group of subjects that use BPM completely (11 % of

micro enterprises and small businesses 0 %). The highest proportions of subjects who use business process management completely contain a group of large companies (51 %), followed by a group of medium-sized enterprises (35 %). In both conducted researches, the influence of company size was reflected in the same way as follows [13]: in the group of small and very small enterprises, there is a significantly higher proportion (34 % and 27 %) of those to whom the term BPM in their company is unknown. Especially the group of

medium-sized and large enterprises shows a higher proportion of subjects who use BPM

partially (44 % and 40 %) and completely (53 % medium-sized and large enterprises).

Tab. 3: The Effect of Company Size on the Utilization Level of BPM in Czech Companies

Company category	Unknown term	Partial use	Process-driven organization	Specific understanding	Unable to assess
Micro	61.11 %	22.22 %	11.11 %	55.60 %	0.00 %
Small	25.00 %	65.00 %	0.00 %	0.00 %	10.00 %
Medium-sized	16.28 %	48.84 %	34.88 %	0.00 %	0.00 %
Large	6.67 %	37.78 %	51.11 %	0.00 %	4.44 %
Total	25.69 %	40.97 %	29.17 %	1.39 %	2.78 %

Source: own analysis

Summary results arising from the previous graph and tables (Fig. 1, Tab. 2, Tab. 3) appear to be deteriorating in comparison with the previous research carried out in 2006 (Fig. 2, [13]). There was an increase in the proportion of respondents to whom the concept of business process management is unknown, and reduction in the proportion of managers who consider their company to be fully process-driven. In connection with the answer *partial use of process management*, the proportion of respondents in both conducted surveys is nearly the same.

It should be noted that the results of these two questions reflect only opinions and attitudes of managers interviewed. The answers are distorted by their perception of the concept of business process management, which may not be entirely correct in many cases. Actual levels of usage of BPM are pursued in the following question (Fig. 2, Tab. 4, Tab. 5), which examines the utilization level of BPM components based on which the real utilization rate of BPM can be derived.

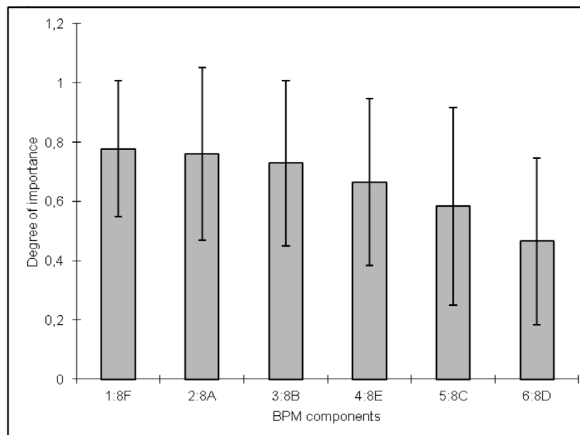
3.1.1 Real Utilization Level of Business Process Management in Czech Companies

Summary results of the question that examines the utilization level of business process management by evaluating the actual utilization of BPM components are illustrated in the following figure. The graph shows that managers consider continuous process improvement as the most important component at the level of 0.78. The BPM component – definition of core

(main) processes is of the same great importance to managers of Czech companies (0.76). Definition of customers and process owners (0.73) can be included among the basic components that are used by our managers and considered as important. The next component is process performance measurement with importance level at 0.67, which can be regarded as a moderately positive result. Regarding creating process maps, managers of Czech companies responded ambiguously (0.58), indicating not too excessive use of this element of process management. Among the group of components, which are used in Czech companies only rarely, can be included the use of process maps to evaluate the cost and time demand factor of all identified processes in companies. This is based on a moderate negative opinion of managers (0.47).

The results indicate that the actual utilization rate in Czech companies is relatively low compared with the results of the first question, where almost 70 % of respondents reported that their company is fully or partially process-driven. Upon these results, it can be concluded that managers of Czech companies perceive the partial use of process management rather as the use of only certain selected BPM components than as the utilization of all BPM components at the same time, however, only in certain areas of the company. Nonetheless, these basic components are closely interlinked and using only some of them can cause the benefits of process management to have little effect.

Fig. 2: Utilization of Individual BPM Components



Source: own analysis

Tab. 4: Legend to the Previous Graph with Quantified Confidence Intervals

Code	BPM components	Average	Standard deviation	Lower interval	Upper interval
1:8F	Continuous process improvement	0.777778	0.229226	0.74002	0.81554
2:8A	Definition of core processes	0.760417	0.291000	0.71248	0.80835
3:8B	Definition of customers and process owners	0.729167	0.279704	0.68309	0.77524
4:8E	Process performance measurement	0.664931	0.282291	0.61843	0.71143
5:8C	Creation of process maps	0.583333	0.333188	0.52845	0.63822
6:8D	Use of process maps	0.465278	0.281435	0.41892	0.51164

Confidence intervals (for reliability estimation of $1 - \alpha = 0.95$), multiple answers

Source: own analysis

The following table (Table 5) demonstrates a huge size impact on the actual rate of utilization of process management in Czech enterprises. Managers of small companies have expressed strong opposition to the use of process maps (creation of process maps at 0.34 and the use of process maps at 0.3) in any other way. Furthermore, they attached almost no importance to process performance measurement (0.45). Managers of these enterprises attach the greatest significance to the definition of customers and process owners, but the response level at 0.69 indicates an ambiguity in this answer. On the contrary, managers of large businesses expressed

almost absolute agreement with continuous process improvement, the definition of core processes and the definition of customers and process owners. Also, a significantly lower number of managers agree with the use of process performance measurement (0.76) and the creation of process maps (0.74). Comprehensively, based on the results (Table 5) can be concluded that the more employees an enterprise has the greater acceptance of the use of the individual components of process management is expressed by its managers. In other words, a growing number of employees cause an increase in significance and the degree of importance that managers assign to individual BPM

components. The results of the effect of company size on the utilization rate of each component of the current survey are comparable with the

results of previous research, which also showed that medium-sized and large enterprises make greater use of all BPM components.

Tab. 5: The Effect of Company Size on the Utilization of Individual BPM Components

Code	BPM components/category of companies	Micro	Small	Medium-sized	Large	Total
1:8F	Continuous process improvement	0.618056	0.7125	0.80814	0.905556	0.777778
2:8A	Definition of core processes	0.645833	0.575	0.854651	0.844444	0.760417
3:8B	Definition of customers and process owners	0.6875	0.575	0.755814	0.805556	0.729167
4:8E	Process performance measurement	0.451389	0.625	0.761628	0.761111	0.664931
5:8C	Creation of process maps	0.340278	0.4	0.703488	0.744444	0.583333
6:8D	Use of process maps	0.305556	0.45	0.494186	0.572222	0.465278

Source: own analysis

Results from the previous research conducted in 2006 [13] and compared with the outcomes of the current research clearly show, despite a slight decrease in results of the first question, a moderate (at least 2–3%) increase in the level of all essential components of process management. The most significant shift in the importance of components occurred in the case of continuous process improvement, which on the scale of importance moved from the third place (from 0.68) to the first place (0.78). Almost the same improvement can be seen in process performance measurement, where there was a shift from 0.59 to 0.67. These shifts can be evaluated very positively, because process performance measurement is the basis of and prerequisite for continuous improvement processes that contributes to the fact that the established process management is dynamic and does not involve redrawing of the existing processes into process maps only.

3.2 The Real Focus of Managers

The aim of this question was to determine the objectives and factors of process management support on which are the managers of Czech companies focusing. Managers expressed a degree of agreement, or disagreement, with statements (factors) that are associated with a process-oriented company. The intention of this question is also to determine whether the conce-

med enterprises have prerequisites for the successful implementation of process management.

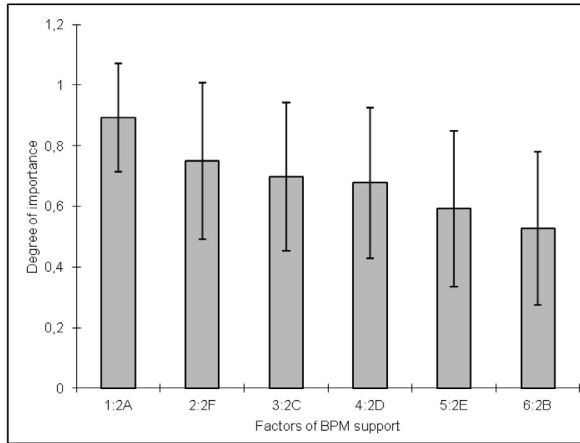
As shown in the summary results (Fig. 3, Table 6), managers of Czech companies see the utmost importance (0.89) in satisfying the needs of external customers. In other words, the respondents consider the outputs (goods and services) of their core processes as the most important. On the scale of importance, the focus on outputs is followed by reducing process costs (0.75) and process performance monitoring (0.69). Managers attach slightly less significance (0.66) to the initiation of process changes to become an incentive for further process improvement. This is followed by an ambiguous expression of importance (0.63) to differentiate processes in terms of their fixed structure, or more precisely, a necessary degree of freedom for selecting an appropriate method of managing these processes. Complete ambiguity (0.53) was reported by the respondents regarding internal customer satisfaction.

From the results it can be inferred that Czech companies clearly focus on external customers only, i.e. on a company's core processes. A small focus on internal customers means that Czech managers attach little emphasis to the management of support processes that provide inputs and operation of core processes. In the case of process management implementation, this fact may cause a certain incompleteness, which can lead to the underutilization of the

potential benefits of process management. Effective management of support processes should reveal the shortcomings of these processes so

their improvement would lead to increased efficiency of core processes, which should have a positive effect on the final customer.

Fig. 3: Real Focus of Managers on BPM Support



Source: own analysis

Tab. 6: Legend to the Previous Graph with Quantified Confidence Intervals

Code	Factors of BPM support in companies	Average	Standard deviation	Lower interval	Upper interval
1:2A	Satisfying the needs of external customers	0.892361	0.178995	0.86288	0.92185
2:2F	Reducing process costs	0.750000	0.259437	0.70726	0.79274
3:2C	Process performance monitoring	0.697917	0.243580	0.65779	0.73804
4:2D	Initiation of process changes	0.677083	0.248905	0.63608	0.71808
5:2E	Differentiation of processes: fixed structure vs. processes with degree of freedom	0.592014	0.257317	0.54963	0.6344
6:2B	Satisfying the needs of internal customers	0.527778	0.252801	0.48614	0.56942

Confidence intervals (for reliability estimation of $1 - \alpha = 0.95$), multiple answers

Source: own analysis

The following table (Table 7) illustrates the effect of company size on factors of process management support in surveyed companies. Responses to this question are influenced by company size to a small extent only. The results, however, quite clearly show that the

importance of individual factors of BPM support grows along with the growing number of employees. Based on this fact, we can suggest that medium-sized and large enterprises have better conditions for applying process management than small and micro companies.

Tab. 7: The Effect of Company Size on Factors of BPM Support in Czech Companies

Code	Factors of BPM support in companies	Micro	Small	Medium-sized	Large	Total
1:2A	Satisfying the needs of external customers	0.847222	0.925	0.901163	0.905556	0.892361
2:2F	Reducing process costs	0.631944	0.8125	0.738372	0.827778	0.750000
3:2C	Process performance monitoring	0.569444	0.6875	0.686047	0.816667	0.697917
4:2D	Initiation of process changes	0.534722	0.625	0.674419	0.816667	0.677083
5:2E	Differentiation of processes: fixed structure vs. processes with degree of freedom	0.583333	0.575	0.627907	0.572222	0.592014
6:2B	Satisfying the needs of internal customers	0.472222	0.875	0.453488	0.616667	0.527778

Source: own analysis

In comparison with the results of previous research, a very slight positive shift occurred only in satisfying the needs of external customers (from 0.88 to 0.89). Other factors show either deterioration, i.e. managers attach lower importance to individual factors of process management support compared to previous research, or there was no change at all.

Despite a slight deterioration in the results of current research in comparison with the previous ones, it can be stated that the companies under consideration have a good prerequisite for the application of process management.

3.3 Who Supports the Use of Techniques and Tools of Business Process Management?

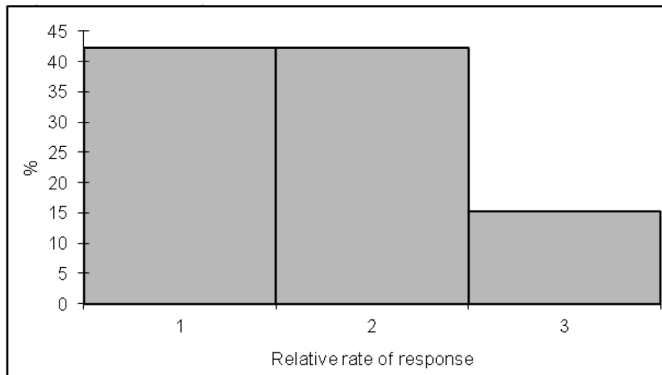
The following question was aimed at finding out how companies implement various tools and techniques of process management. The purpose was to determine the extent to which businesses use during the BPM implementation and BPM components their own employees, BPM training courses and consulting companies. In the case of using consulting companies, managers were asked about the area for which the consulting company services were used. Managers, who had answered in the first

question that process management is an unknown term to them, did not respond to this question, i.e. the question was answered by only 75 % of respondents. Respondents had an option of multiple choice answers. The results therefore can not infer the exact number of businesses using the various interest groups.

Summary results of this question are displayed in the following figure and table (Fig. 4 and Tab. 8), from which it is clear that companies implementing BPM tools and techniques use mainly the experience of own employees and knowledge gained in BPM training courses (almost 85 % of all responses). Only 15 % of responses concerned the possibility of using services of consulting companies. Only 8 of the 22 managers who confirmed the use of external companies specified in greater detail the specialization of the consultancy used. Most often it was a consultancy focused on improving production processes, specifically, e.g.:

- Problem-solving methodology,
- QMS,
- Poka – Yoke,
- Logistics,
- Improvement of production processes,
- SMED.

Fig. 4: Interest Group



Source: own analysis

Tab. 8: Legend to the Previous Graph with Quantified Confidence Intervals

Code	Interest group	Number	Proportion of answers	Lower interval	Upper interval
3A	Own employees only	61	42.36 %	0.34592	0.505272
3B	BPM training courses	61	42.36 %	0.34592	0.505272
3C	Consulting company	22	15.28 %	0.103109	0.220491

Confidence intervals (for reliability estimation of $1 - \alpha = 0.95$), multiple answers

Source: own analysis

The effect of company size on this question appears to be significant. However, it should be noted that the question was not answered by managers for which the BPM is an unknown term, i.e., managers of mostly micro and small enterprises. Since the use of consulting services

can be very expensive, it is not surprising that these services are used almost exclusively by medium-sized and large enterprises. Even more surprising is the fact that micro enterprises make greater use of external consultants in comparison with BPM training courses.

Tab. 9: The Effect of Company Size on the Use of Interest Groups

Code	Interest group	Micro	Small	Medium-sized	Large	Total
3A	Own employees only	16.39 %	14.75 %	37.70 %	31.15 %	1
3B	BPM training courses	4.92 %	11.48 %	26.23 %	57.38 %	1
3C	Consulting company	9.09 %	0.00 %	45.45 %	45.45 %	1

Source: own analysis

In comparison with the results of the previous research, there has not been any significant change.

3.4 Priority of Goals in the Implementation of Process Management

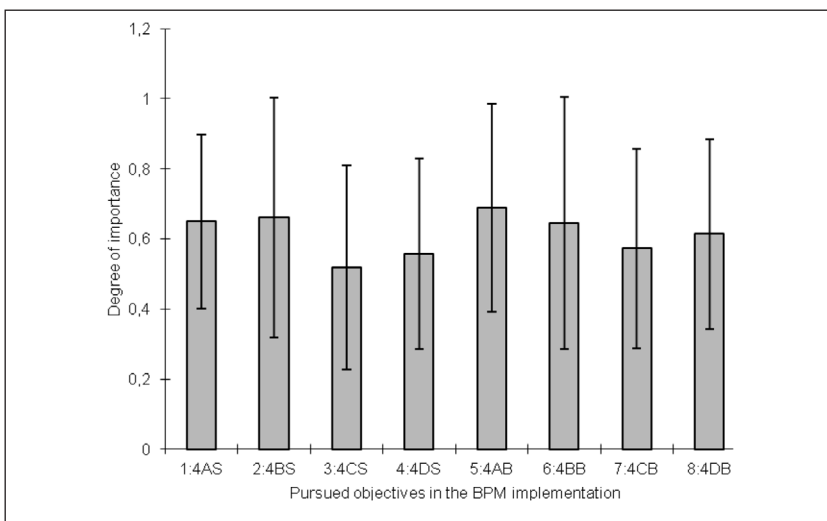
The purpose of this question was to identify objectives that managers pursue by process management implementation. In other words, the results of this question show the emphasis which managers attach to secondary objectives that are closely linked to process management implementation. A question pursuing the priority of goals in process management implementation is designed to clarify the opinion of managers of the existence of the synergetic effect regarding the use of process management implementation as an overall strategic change as part of the certification according to ISO 900X, as part of the implementation of a new information system or only as part of the partial improvement of processes. The question examines the current attitude of managers to the issue as well as the expected change in attitudes in the future.

The graph and table below (Fig. 5, Tab. 10) show the summary results of this question. As can be seen from these outcomes, the opinions of managers on this issue in all sub-questions

are not clear enough. Currently, managers of Czech companies see the greatest significance (0.66) of using the process management implementation in certification according to ISO 900X. It is followed by, with almost the same degree of importance (0.65), process management implementation as an overall strategic change (i.e. as the need to respond to fundamental changes in the business environment, the need for a change in the corporate organizational architecture, e.g. the transition to horizontal organizational structure, the emergence of autonomous teams within a company, changes in the way of motivation, etc.). Managers expressed only weak consent (0.56) to the statement on the use of BPM as a tool in the implementation of a new IS. The biggest ambiguity in decisions (0.52) was evident in connection with the use of process management for minor changes to improve the selected group of processes.

As already mentioned, the issue also examines a possible shift in priorities of objectives in process management implementation in the future. These results are also displayed in Fig. 5 and Tab. 10. In the future, managers will focus more on both the BPM implementation as an overall strategic change (shift from 0.65 to 0.69) and the use of BPM for minor changes to improve selected processes (shift from 0.51 to

Fig. 5: Priority of Objectives in the BPM Implementation



Source: own analysis

Tab. 10: Legend to the Previous Graph with Quantified Confidence Intervals

Code	Pursued objectives in the BPM implementation	Average	Standard deviation	Lower interval	Upper interval
1:4AS	BPM as an overall strategic change (present)	0.649533	0.247296	0.60213	0.69693
2:4BS	Certification according to ISO 900X (present)	0.661215	0.342115	0.59564	0.72679
3:4CS	Partial improvement of processes (present)	0.518692	0.29078	0.46296	0.57442
4:4DS	IS implementation (present)	0.558411	0.271655	0.50634	0.61048
5:4AB	BPM as an overall strategic change (future)	0.689236	0.297493	0.64023	0.73824
6:4BB	Certification according to ISO 900X (future)	0.645833	0.359073	0.58669	0.70498
7:4CB	Partial improvement of processes (future)	0.572917	0.283391	0.52624	0.6196
8:4DB	IS implementation (future)	0.614583	0.270772	0.56998	0.65919

Confidence intervals (for reliability estimation of $1 - \alpha = 0.95$), multiple answers

Source: own analysis

0.57) and, last but not least, the use of BPM in the implementation of a new IS (shift from 0.56 to 0.61). Only the use of BPM for the requirements of certification according to ISO 900X in the future was expressed less clearly by the addressed managers than at present.

The following table (Table 11) illustrates the effect of company size on a priority of secondary objectives that managers of Czech companies pursue by process management implementation. The results imply that company size does not have a significant impact on the priority of secondary objectives in the BPM implementation. As in previous research, even the current research shows large ambiguity mainly on the part of managers of micro as well as small enterprises. The greatest importance for small enterprises consists in the BPM implementation for certification according to ISO 900X. The process management implementation as an overall strategic change is attached the greatest importance by managers of large companies, who also expect an increase in the importance of this objective in the future. From the results it can be concluded that the larger the company the more managers of Czech companies perceive the BPM implementation as an overall strategic change.

3.4.1 Comparison of the Results with the Previous Research

Upon the comparison of the two researches (Fig. 5, Tab. 10), [13] we can claim a greater level of agreement with all the statements specified in the survey conducted in 2012. Questions about future views on priorities of objectives in implementing BPM were asked in a time horizon of 5 years. The time difference in the implementation of both the above researches was 6 years, i.e. the research results from 2006 regarding the future should correspond with the findings of the research focusing on the present situation.

The research shows that managers in the previous period assumed a greater growth in the importance in the future only in the case of the process management implementation as an overall strategic change (up to 0.73). The present results, however, showed an increase to 0.65 only. Therefore, there was a slight increase in the importance of this secondary objective than the last survey anticipated. For all other secondary objectives pursued by the process management implementation in 2006, managers expected only a slight increase in importance. The results of this year's survey, however, showed in almost all cases a much

Tab. 11: The Effect of Company Size on the Priority of Objectives in the BPM Implementation

Code	Pursued objectives in the BPM implementation	Micro	Small	Medium-sized	Large	Total
1:4AS	BPM as an overall strategic change (present)	0.535714	0.566667	0.604167	0.755952	0.649533
2:4BS	Certification according to ISO 900X (present)	0.428571	0.733333	0.694444	0.684524	0.661215
3:4CS	Partial improvement of processes (present)	0.517857	0.533333	0.576389	0.464286	0.518692
4:4DS	IS implementation (present)	0.5	0.7	0.534722	0.547619	0.558411
1:4AB	BPM as an overall strategic change (future)	0.520833	0.5875	0.715116	0.844444	0.689236
2:4BB	Certification according to ISO 900X (future)	0.493056	0.7	0.744186	0.65	0.645833
3:4CB	Partial improvement of processes (future)	0.611111	0.5375	0.651163	0.483333	0.572917
4:4DB	IS implementation (future)	0.618056	0.7125	0.575581	0.605556	0.614583

Source: own analysis

greater degree of agreement than was anticipated by the previous research. Specifically, it involves the following results: a shift from the level 0.54 to 0.66 (the process management implementation for the use of BPM for the requirements of certification according to ISO 900X), a shift from the level 0.43 to 0.51 (the use of BPM for partial changes to improve selected processes), and a shift from the level 0.52 to 0.55 (the use of BPM in the implementation of a new IS).

The previous research pointed out the following priorities of objectives in implementing BPM: BPM as an overall strategic change, certification according to ISO 900X, IS implementation, partial improvement of processes. According to responses of managers regarding the future, there were no changes in priorities of these objectives expected in this research. Nevertheless, the current research shows that some changes have occurred. At present, the priority of the objective associated with certification according to ISO 900X is the highest, followed by the BPM implementation as an overall strategic change. The lowest priority for managers is currently the use of the BPM implementation for minor changes to improve the selected processes.

Discussion and Conclusion

The survey carried out in Czech companies was a valuable source of information providing the authors with an opportunity to create and provide a comprehensive overview of the use of process management in the Czech Republic. In connection with the formulated hypotheses, the evaluation of individual questions that were the subject of this paper allowed to establish the following conclusions:

1. The findings of the first question aimed at extending the concept of process management in the Czech Republic showed that almost 26 % of respondents identified this term as unknown, and less than 3 % of respondents were unable to answer this question. Due to the fact that 70 % of respondents consider their company to be fully or partially process-driven, it can be stated that the concept of process management in the Czech Republic is well developed. This conclusion is confirmed by an interview with Professor Wilhelm Scheer [12], who claims that the term process management is indeed wide-spread and in the Central Europe, including the Czech and Slovak Republics, and there is no need

to clarify its importance very much. The creator of the ARIS methodology defines process management as a tool to gain a competitive advantage over other companies and a trend that is gradually spreading through banks, financial institutions, and engineering and energy companies to the entire market.

2. A comparison of the results of the current and the previous research [13] shows a slight (by at least 2–3%) increase in the level of the use of all the essential components of process management, which can be considered as an ambiguous confirmation of H2. The most significant shift in the importance of individual components occurred for the respondents in case of continuous process improvement, which shifted on the scale of importance and significance from the third place (from 0.68) to the first place (0.78). Almost the same improvement is presented by process performance measurement; there was a shift from the level 0.59 to 0.67. These shifts can be evaluated very positively, because process performance measurement is the basis of and prerequisite for continuous process improvement that contributes to the fact that the established process management is dynamic and does not involve only redrawing of the existing processes into process maps.
3. The results of questions aimed at finding out the level of the use of each component of process management can lead to a conclusion that managers of Czech enterprises attach great importance to the use of the following components: continuous process improvement, definition of core processes, definition of customers and process owners and process performance measurement. BPM components related to the creation and use of process maps are not as important to Czech managers. The difference in the degree of importance that managers attach to individual BPM components, which can be derived from different degrees of their use, means that managers of Czech companies do not apply all components during the BPM

implementation simultaneously, but only some. This fact confirms the renewed hypothesis that managers do not understand the interconnectedness of individual BPM components. In relation to the first question focused on the full or partial use of BPM and based on the results of this question, conclusion can also be drawn that managers of Czech companies view the partial use of process management as the use of only certain selected BPM components rather than all BPM components at the same time but only in some fields of the company. These basic components, however, are closely interlinked and using only some of them can cause the benefits of process management to have little effect. The investigated interconnection of individual BPM components lies in the fact that creating process maps leads also to defining core processes, their customers and owners. The subsequent use of process maps to assess, e.g. costs or time requirements of defined processes is associated with process performance measurement, because the actual process maps can be a source of information for performance measurement, which is the basis of and prerequisite for continuous process improvement as well.

Regarding of process measurement performance, some authors, such as Rajnoha, Chromjaková recommend e.g. implementation of Activity-Based-Costing (ABC) method in the enterprise.

Additionally, implementation of calculation based on processes and activities brings about also non-quantified effects such as:

- transparency and rationalisation of performed activities and processes,
- more responsible proceeding of enterprise work,
- identification of enterprise's competitive advantages or disadvantages,
- information support for strategic management and goal oriented management,
- assignment of overhead costs to performance on case-by-case basis,
- support of price policy and production-sales program optimisation [7].

Interconnection of the mentioned BPM components is rooted in many definitions of process management. An example can be, e.g. a definition by Závadský, who defines process management as [18] a systematic identification of business processes (definition of core (main) processes and definition of customers and process owners), visualization (creation of process maps), measurement, evaluation, and continuous business process improvement (the use of process maps, performance measurement and continuous process improvement) using the methods and principles, which are based on the process approach. Other authors agree that [6], [9] process management is the driving force for the profitability of the company and they characterize BPM as a discipline of modeling, automating, managing and optimizing business processes. Even in this definition, we can find the individual BPM components incorporated.

4. Upon the results listed in section 3.2, it can be clearly deduced that Czech companies are focused mainly on external customers, i.e. on core processes in the company only. Small internal customer orientation means that Czech managers do not attach importance to the management of support processes that provide inputs and operation of key processes, which confirmed Hypothesis 4. This may in the case of implementation of process management cause incompleteness, which may lead to the insufficient use of all potential benefits of process management. Effective management of support processes should reveal the shortcomings of these processes and their improvement would lead to increased efficiency of core processes, which should have a positive effect on the final customer as well. The fact that supporting processes do not directly make profit and are not intended for external customers does not mean that they should not be given due attention. Even these processes must be, according to [16], defined, evaluated and improved to ensure continuous improvement of the whole company. Nevertheless, they fall into the

area of the corporate sector, thus management which can be outsourced or managed using the Facility Management.

5. The results specified in section 3.3 clearly support the hypothesis that the use of consulting services in Czech manufacturing enterprises is not very widespread. In the BPM implementation, enterprises primarily rely on the knowledge of their own workers and information obtained by employees participating in BPM training courses. However, it can be noted that medium-sized and large businesses use the services of external consultants to a greater extent.
6. A question inquiring into managers' focus on secondary objectives related to the implementation of process management (section 3.4) also examines the perception of process management as an overall strategic change. Ambiguity in the opinions of Czech managers can not clearly confirm or disprove the last hypothesis. Currently, managers in the BPM implementation focus more on the requirements of certification according to ISO 900X. In the future, however, it is possible to expect from managers a shift moving towards the understanding of process management as an overall strategic change. On the other hand, it should be noted that the previous research had expected from the current one much higher levels of agreement with the perception of BPM as the overall strategic change than actually shown by the managers.

The issue of BPM vs. IT? It is possible to state, that organizational change using IT can begin with an analysis of existing organizational elements and an identification of ways to change the dependencies among them, especially between processes. Therefore, IT is one of the fundamental elements of Business Process Change (BPC) [4]. Its role is significant throughout the entire duration of process change: before the process is designed (IT as an enabler), while the process is being designed (IT as a facilitator) and after the design is complete (IT as an implementer). Therefore, building a responsive IT infrastructure is the

key factor for successful implementation of BPC. There is considerable anecdotal evidence that even small changes in the use of IT in an organization may require major restructuring of the organization to take full advantage of the efficiencies created by the technology. Conversely, there is also significant evidence that without major restructuring, the introduction of IT may not produce savings needed to justify the investment. Although the evidence for organizational restructuring to accompany technological change is strong, there is much less agreement on exactly what organizational changes are needed to take full advantage of the technology [4].

The utilization of process management in the Czech Republic, according to [17], can be also indicated as a hot topic today. Based on the conducted research, it is evident that the level of the use of BPM has been still, albeit slowly, growing. Managers begin to gradually understand the transition to process management as an overall strategic change. The complexity of individual components of process management is also starting to get into the minds of Czech managers of primarily medium-sized and large enterprises. As a negative result of the research carried out can be identified the fact that Czech managers put hardly any emphasis on the management of supporting processes and internal customer satisfaction.

References

- [1] CARDOSO, J., MENDLING, J., NEUMAN, J. and REIJERS, H.A. A discourse on complexity of process models. In EDER, J., DUSTDAR, S. et al (eds.). *BPM 2006 workshops. Lecture Notes in Computer Science* 4103. Berlin: Springer-Verlag, 2006. pp. 115–126. ISBN 978-3-540-38444-1.
- [2] GRASSEOVÁ, M., DUBEC, R. and HORÁK, R. *Procesní řízení ve veřejném sektoru: Teoretická východiska a praktické příklady*. Brno: Computer Press, 2008. ISBN 978-80-251-1987-7.
- [3] GRUHN, V. and LAUE, R. Complexity metrics for business process models. In ABRAMOWICZ, W. and MAYER, H.C. (eds.). *9th international conference on business information systems*. 2006, Vol. 85, pp. 1–12. ISSN 1109-2750.
- [4] HABJAN, A. and POPOVIC, A. How internal processes benefit from IT investments and therefore enhance company's competitiveness –

a case study of Slovenian small and medium sized companies. *WSEAS Transactions on Business and Economics*. 2008, Vol. 5, Iss. 5, pp. 233–242. ISSN 1109-9526.

- [5] KHLIF, W., ZAABOUB, N., BEN-ADBALLAH, H. Coupling metrics for business process modelling. *WSEAS Transactions on Computers*. 2012, Vol. 9, Iss. 1, pp. 31–40. ISSN 1109-2750.
- [6] LLEWELLYN, N., ARMISTEAD, C. Business process management: Exploring social capital within processes. *International Journal of Service Industry Management*. 2000, Vol. 11, Iss. 3, pp. 225–243. ISSN 0956-4233.
- [7] RAJNOHA, R. and CHROMJAKOVÁ, F. Activity based costing and efficiency of its application in the wooden houses production. *DREWNO-WOOD*. 2009, Vol. 52, Iss. 181, pp. 105–127. ISSN 1644-3985.
- [8] RYTÍŘ, V., STRÍŽ, P., KLÍMEK, P. a KASAL, R. *Přednášky z metod statistické analýzy*. 2. rozšířené vyd. Zlín: UTB ve Zlíně, Academia centrum, 2006. ISBN 80-7318-433-8.
- [9] SUHENDRA, S.E. and OSWARI, T. Business Process Management in Organization: A Critical Success Factor. *Journal of US-China Public Administration*. 2011, Vol. 8, Iss. 1, pp. 110–120. ISSN 1548-6591.
- [10] ŠIMONOVÁ, S. *Modelování procesů a dat pro zvyšování kvality*. 1. vyd. Pardubice: Univerzita Pardubice, Fakulta ekonomicko-správní, 2009. 192 s. ISBN 978-80-7395-205-1.
- [11] ŠMÍDA, F. *Zavádění a rozvoj procesního řízení ve firmě*. 1. vyd. Praha: Grada Publishing, 2007. 293 s. ISBN 978-80-247-1679-4.
- [12] ŠUPŠÁK, J. *BPM – alfa a omega efektivnosti* [online]. eFOCUS, c2009. 2006-07-29 [cit. 2012-12-11]. ISSN 1337-9801. Dostupné z: <<http://www.efocus.sk/archiv/kategoria/riadenie-procesov/clanok/bpm-alfa-a-omega-efektivnosti/>>.
- [13] TUČEK, D. a ZÁMEČNÍK, R. *Řízení a hodnocení výkonnosti podnikových procesů v praxi*. Zvolen: Technická univerzita vo Zvolene, 2007. ISBN 978-80-228-1796-7.
- [14] TUČKOVÁ, Z. Importance of Knowledge Services in the Czech Republic and Germany: A Case Study. In *Proceedings of the 13th European Conference on Knowledge Management*. Spain, 2012. pp. 1202–1210. ISSN 2048-8963.
- [15] VUKOVIČ, G. and SIKOŠEK, M. The Influence of Team Roles Structure on Team Efficiency: Case Analysis of a Team Organising Academic Event. *E+M Ekonomie a Management*.

2005, Vol. 8, Iss. 4, pp. 79–94. ISSN 1212-3609.

[16] VYSKOČIL, V.K. a kol. *Management podpůrných procesů: Facility Management*. 1. vyd. Praha: Professional Publishing, 2010. 415 p. ISBN 978-80-7431-022-5.

[17] WESKE, M. *Business Process Management-Concepts, Languages, Architectures*. New York: Springer Berlin Heidelberg, 2007. 368 p. ISBN 978-3-540-73521-2.

[18] ZÁVADSKÝ, J. *Systémové pojednání o procesním řízení*. 1. vyd. Praha: Alfa Publishing, 2004. ISBN 80-86851-15-X.

doc. Ing. David Tuček, Ph.D.

Tomas Bata University in Zlín
Faculty of Management and Economics
Department of Industrial Engineering
and Information Systems
tucek@fame.utb.cz

Ing. Michaela Hájková

Tomas Bata University in Zlín
Faculty of Management and Economics
Department of Industrial Engineering
and Information Systems
mhajkova@fame.utb.cz

Ing. Zuzana Tučková, Ph.D.

Tomas Bata University in Zlín
Faculty of Management and Economics
Department of Enterprise Economics
tuckova@fame.utb.cz

Doručeno redakci: 1. 1. 2013

Recenzováno: 6. 2. 2013, 5. 3. 2013

Schváleno k publikování: 12. 4. 2013

UTILIZATION LEVEL OF BUSINESS PROCESS MANAGEMENT IN CZECH ENTERPRISES – OBJECTIVES AND FACTORS**David Tuček, Michaela Hájková, Zuzana Tučková**

The aim of this article is to provide a comprehensive overview of the utilization rate of Business Process Management (BPM) and its components in Czech factories focused on goals that managers follow by the implementation of process management and the factors that are merged with a process-oriented company. The paper presents a part of current results of the research conducted by a questionnaire survey. The whole research was focused on several aspects of process management. Within this research, aspects of Business Process Management are understood with the meaning of the views or positions on the issues of Business Process Management with a focus on the objectives, factors, components, support, benefits and barriers to BPM implementation. The purpose of the research was to monitor the attitudes, opinions and judgments of managers of Czech firms to individual aspects of BPM. Since this is a subjective expression, which is subsequently necessary to evaluate statistically were used in this study a scaling method, based on a quantification of qualitative data. The meeting the objective of this article was conditioned by confirmation or refutation of the hypotheses aimed at extending the concept of BPM in the Czech Republic and its understanding, the utilization rate of BPM in the Czech manufacturing companies, the complexity of BPM components and the orientation of Czech managers to support management processes. The complete results of the research showed positive development in almost all observed aspects. The largest positive change occurred in the perception of the importance of process performance measurement. This shift can be evaluated very positively, because the performance measurement process is the basis and prerequisite for continuous improvement of processes, which helps to ensure that the established BPM is dynamic and does not involve redrawing of the existing processes into process maps only.

Key Words: Business Process Management, BPM components, ARIS (Architecture of Integrated Information Systems), utilization rate of business process management.

JEL Classification: M11, M15, O31.