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Cultural Differences in Implementing Business Process Management Systems

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ABSTRACT

In this paper we present the results of an international comparative research conducted through a special web survey, i.e. an online 'game' to rate and classify Critical Success Factors (CFSs) for BPMS implementations. The survey was completed by 39 respondents from 11 different countries. Central to the research was the question how BPM-systems success factors are perceived by professionals from different countries (i.e. cultural backgrounds) and how this is related to other characteristics such as their level of experience within the BPM domain. The respondents judged a total of 55 factors in two ways: (1) by allocating them to one of the five domains of BPMS implementation, and (2) by ranking their importance for BPMS implementations. Significant differences were found between respondents from Northern European versus Anglo-American countries, and between respondents with different levels of experience with BPMS implementations.

Keywords

BPM-systems, implementation, cultural differences, critical success factors.

INTRODUCTION

After the term Business process management systems (BPMS) was already introduced in the mid nineties (Karagiannis, 1995), it has generally been described as a standard application for process improvement, execution, control and monitoring for both organizations and inter-organizational systems (cf. Chen et al. 2007). After reviewing a number of definitions, Ravesteyn and Versendaal (2007) define a BPM-system in a more elaborated way as "a (suite of) software application(s) that enable the modeling, execution, technical and operational monitoring, and user representation of business processes and rules, based on integration of both existing and new information systems functionality that is orchestrated and integrated via services." From this extended definition it becomes clear that a BPMS cannot be regarded as a regular or standard enterprise system. Although a BPMS is in essence process centric, it also comprises functionality to integrate existing information systems and enable the development of service oriented architectures (Krafzig et al., 2005; Weske, 2007). Consequently, existing implementation methods for enterprise systems cannot be directly applied to the implementation of a BPMS. Hence, existing implementation methods should be adapted or a new method should be developed. A first step in recognizing the activities that should be part of a BPMS implementation is creating an overview of factors that contribute to the success or failure of such an implementation. While there have been many studies on the critical success factors (CSFs) of enterprise systems (i.e. ERP) implementation (Bradford and Florin, 2003; Botta-Genoulaz, Millet and Grabot, 2005; Hong and Kim, 2002; Kamhawi, 2007), studies on the CSFs for BPMS implementation are still scarce.

In this paper we built on the work by done by Ravesteyn and Versendaal (2007) and Ravesteyn and Batenburg (2008) who identified 55 success factors of BPMS implementation in the Netherlands. The first study consisted of a multi method research approach to discover and validate success factors when implementing BPMS. The success factors found through

literature study were validated by 68 respondents in a qualitative research conducted in the Netherlands. The second study presented the results of a survey among a group of 39 Dutch consultants, developers and end-users. It describes their view on the concepts of BPM, BPM-systems and success factors for implementation. In this study a set of 26 success factors (a subset of the 55 factors of the first study) was validated by conducting a survey. While the list of 55 success factors seems valid for the Dutch market, both studies mention that the research results are not necessarily applicable to other countries or regions. From this, the trigger emerges to explore whether there are differences across different countries in the perceived importance of CSFs for implementing BPMS. To put this trigger into an empirical study, a number of factors need to be taken into account, most important the level of experience organizations and professionals in different countries have in the domain of BPMS implementation. In this paper we present the design and result of such an international study aiming to answer the following research question: *How are BPM-systems success factors perceived by professionals from different countries (i.e. cultural backgrounds) and how is this related to other characteristics such as the respondents level of experience within the BPM domain*?

In the following section the research design is described. Section 3 presents an overview of the data analysis and results. Finally sections 4 and 5 give preliminary conclusions regarding the research question and suggestions for further research.

RESEARCH DESIGN

To conduct an empirical study that can answer the central research question, an international web survey was developed for BPM(S) professionals. The survey consisted of three parts. The first part contained six general questions in which information about respondents was gathered concerning nationality, gender, organization sector, function, level within the organization (e.g. executive, middle management, operational etc.), and years of experience within the BPM domain. The list of nationalities was based on the ISO 3166-1-alpha-2 code from which we omitted countries with a population less than 500,000. The sectors or industry of employment that respondents could select are based on the International Standard Industrial Classification of All Economic Activities of the United Nations (ISIC Rev. 3.1, 2002). Level of experience with BPM(S) was queried by five categories: 0-2, 2-5, 5-10, 10-15 and >15 years of experience. In the final part of the survey, two questions asked respondents to leave their e-mail address and comments or remarks. The main part of the survey consisted of 55 questions concerning 55 CSFs for BPMS implementation (the appendix provides the full description of all CSFs). For each CSF respondents were asked to (a) give an importance score between 1 to 7 on a Likert scale (1=very insignificant to 7=very important) and, (b) assign the CSF to one of five different domains:

1. The domain of the business organization and its processes, labeled ‘Management of organization and processes’;
2. The measurement and control function within the organizational domain, labeled ‘Measurement and Control’;
3. The BPMS implementation project domain, labeled ‘Implementation and change management’;
4. Determining the architecture that the BPM-system implementation should enable, labeled ‘Architecture’;
5. Software and service development activities within the project domain that are part of the BPMS implementation, labeled ‘Solution development’.

The list of 55 CSFs when implementing BPM-systems is based on an earlier literature study that was subsequently validated at several Dutch organizations as described by Ravesteyn and Versendaal (2007). From this study we also apply the five domains described above. These domains represent important aspects of BPM-systems implementation that can be found in many other implementation methods (Ravesteyn and Jansen, 2009). In total, the constructed survey consisted of 116 pre-structured questions and 2 open questions.

The part of the survey by which the respondents were asked to rate and allocate the 55 CSFs was developed as a ‘game’. Instead of asking respondents 110 questions, the 55 success factors were showed on a webpage as ‘playing cards’ that can be placed on a ‘allocation board’ (i.e. matrix) consisting of seven by five fields which represent the five domains on the one hand, and the 7 importance scores on the other. In this way, the respondents were able to quickly allocate these 55 CSFs to the cells of the matrix by dragging and dropping. Each ‘factor-card’ can be allocated to each of the 35 cells on the board, thereby actually assigning two values to each factor. Figure 1 shows the architecture of the developed ‘digital game’ (to be found at www.bpm.hu.nl/bpm’game’).

Garbage bin	1	2	3	4	5	6	7
Management of organization and processes							
Measurement and Control							
Implementation and change management							
Architecture							

Figure 1. Architecture of the allocation board of the BPM game

Testing showed that the time needed to categorize the success factors was approximately 15 minutes. In addition, the possibility was added to the application to drop a CSF in a 'garbage bin' if a respondent believed that it was not relevant, i.e. unrelated to BPMS implementation. The web survey was designed in such a way that respondents had to answer the six general questions about their background before they were invited to 'play the game'.

The web survey and its game/allocation tool were tested by a group of 10 students that followed a BPM course as part of the Master of Informatics at the HU University of Applied Sciences. During testing, some bugs were found and fixed. The web survey, including the tool linked to an initiated database, was launched in October 2009 via the Internet. By posting messages in 15 BPM related LinkedIn groups (such as BPM Guru, Business Process Improvement, BP Group, BPM Professionals Group and others) the research was put under the attention of BPM interested professionals. The first messages that were posted in each group reached approximately around 26 thousand persons. Because many join several groups, and most of them do not participate actively, it is not possible to estimate the number of unique persons that was reached with the posted messages. After posting two reminders, each after one month, a total of 109 professionals have visited the website and started the survey. From these, 59 respondents only answered the first six questions and quit the survey after they reached the 'game' allocation board. Of the 50 respondents that started the 'digital game' by dragging and dropping CSF cards, another 11 stopped before 10 cards were allocated. These persons were regarded as non-respondents as well. Finally, a total of 39 participants (36 men and 3 women) finished the web survey completely. These respondents were included in the analysis.

Due to the limited size of the response group respondents with different nationalities were clustered into three 'cultural' groups of countries. Respondents from the United Kingdom, United States and Canada were clustered in a group labeled 'ANGLO' (23%). A second group labeled 'NORDIC' consists of respondents from Norway, Sweden, Finland, Denmark and the Netherlands (41%). The third and final group was labeled 'OTHER' and contains respondents from other countries (36%). This clustering can be related to the cross-national study by Hofstede (1982). In his highly cited study, Hofstede has developed country scores on the four cultural dimensions: power distance (PDI), individualism (IDV), masculinity (MAS), and uncertainty avoidance (UAI). Following Hofstede, it can be assumed that all countries in the ANGLO group particularly score high on individualism and masculinity, while countries in the NORDIC group score high on individualism but low on masculinity. From this, it can be expected that these countries differ in assertiveness as well as in competitiveness, i.e. ANGLO countries score high, NORDIC countries score low on these dimensions. Hence we expect that this influences the opinions of professionals that are employed in these countries, and consequently has an effect on how CSFs for BPM-systems implementation are perceived by professionals.

The levels of respondents' experience were also categorized from five levels to three levels to achieve a sufficient number of cases within each category to perform split analysis. Most of respondents had less than 5 years of experience (44%), 28% had 5 to 10 years of experience, while 28% over 10 years of BPM(S) experience.

Finally, there is relevant variation between the respondents in terms of their sector of employment and position within the organization. Most respondents categorized themselves as manager (38.5%), consultant (28.2%) and business analyst (15.4%). Respondents are mostly employed in the IT sector (36%), scientific and technical services (20%), and finance and insurance (15%).

DATA ANALYSIS

The data available for analysis is based on the answers of 39 respondents. Some indication on data validity can be derived from their answers and scores. Only eight of the respondents left comments or questions after finishing the web survey. Two commented that the formulation of some of the CSFs while three stated that at the start of the 'game' it was not clear that it was possible to drop more than one success factor in a particular cell of the matrix. Given this limited number of comments, it can be concluded that among the participants who completely finished the 'game' there was little confusion about the formulation of success factors or the working of the 'game'. Also, respondents dropped on average 2.07 success factors in the

garbage bin. This means that overall the participants agree that the list of 55 CSFs is indeed relevant when implementing a BPM-system. The two factors that were allocated to the bin most often were:

- '*Information-processing work should be subsumed into the real work that produces the information*' (7 times) and
- '*For global inter-operability, transparency to the end user is needed where this has consequences for the information availability*' (5 times)

An explanation can be that respondents found these items too vague or simply too obvious to clearly judge them on importance or allocate them to a BPM domain.

To be able to answer the research question we performed ANOVA-analysis to determine if there are significant differences between (a) professionals from the three different cultural groups of nations and (b) professionals with different levels of experience, with regard to their importance rating and allocation of the SCFs to the domains.

Differences Between Professionals from the Three Country Clusters

The first ANOVA-analysis (not shown here) shows no significant differences (significance level $p<.05$) between the three cultural groups on how respondents allocated all CSFs over the five domains. It is worth nothing however, that respondents from the NORDIC group allocated more CSFs (12.31) to the BPMS implementation project domain compared to respondents from the ANGLO (8.11) and OTHER countries (8.85). It might be the case that respondents from the NORDIC group of countries believe that more CSFs should be specifically taken into account during project and change management activities.

The second ANOVA-analysis did show significant differences between respondents from the three cultural groups, with regard to their importance scores on 8 out of 55 CSFs for BPMS. Table 1 gives an overview of these CSFs and the (significant) differences between the three groups.

	Country cluster			
	ANGLO	NORDIC	OTHER	Total
-1- Know-how and experience with Project Management	6.11	6.38	**4.23**	5.58
-2- Experience with Change Management	6.33	6.13	**5.08**	5.82
-3- Understanding the Business Process Management concept	4.89	**6.38**	5.31	5.66
-4- Strong management support and involvement is needed	6.00	**6.69**	5.50	6.10
-11- Establishing a support organization is vital to ensure ongoing maintenance and management of processes	5.78	5.75	**4.15**	5.21
-14- The BPM(S) implementation should start within the organization before external processes and systems are included	3.25	**5.25**	3.92	4.36
-38- Understanding how processes and data are linked together	5.33	**6.19**	4.57	5.41
-50- Creating a culture of attention to quality within the organization	5.89	6.19	**5.07**	5.72
N	9	16	14	39

Table 1. Eight CSFs that were rated significantly different on their importance for BPMS implementation, by respondents from three country clusters

As can be seen, respondents from the NORDIC group rated factors 3, 4, 14 and 38 significantly higher as the respondents from the other two groups while the group OTHER rated factors 1, 2, 11 and 50 significantly lower than the other groups. If we analyze the differences between the ANGLO and NORDIC groups, factors like '*understanding the BPM concept',* having *strong management support and involvement,* the need for *the BPM(S) implementation to start within the organization before external processes and systems are included* and *understanding how processes and data are linked together* are judged to be more important by professionals from Northern European countries compared to the professionals from the United States, United Kingdom and Canada. Alternatively the respondents from the OTHER group have a lower rating for factors such as *experience with project management*, *change management*, *establishing support within the organization to ensure ongoing maintenance and management of processes*, and *attention to creating a culture of quality within the organization* compared to the other two groups.

Differences Based on the Experience Level of the Respondents

A third ANOVA-analysis was performed to determine if respondents with different levels of BPM(S) experience differ in how they assigned the CSFs to the five different domains (not shown here). Contrary to the previous analysis on country clusters, significant differences in experience were found, in particular with regard to the allocation of CSFs to domain 3: *Aspects concerning the project management of the implementation of a BPM-system*. Respondents with more than 10 years of experience assigned significant more factors (on average 13.36) to that domain than the other groups (5 years or less experience: 8.47, 5-10 years: 9.36). From this, it can be concluded that the most experienced respondents believe that many CSFs are part of managing the implementation of a BPM-system and any changes that occur due to this. The domain to which the most experienced respondents allocated most other CSFs was domain 5: *Software and service development activities that take place as part of the project*. This further supports that professionals with much experience on BPMS implementation believe that these mostly fail due to either insufficient project management or mistakes at the IT part of the project (i.e. development of (web) services or integration of information systems as part of the project).

In the final ANOVA-analysis, we found three CSFs with significant differences in how the three groups assigned an importance rate to the success factors (see table 2).

	Experience levels			
	< 5 years	5-10 years	>10 years	Total
-5- The BPM(S) effort should be aligned to the organizations strategy	**5.69**	6.82	6.73	6.32
-8- An organizations culture will influence the success of the BPM(S) project	**5.19**	6.27	6.91	6.00
-55- Granularity and visibility control should be managed (to rule out that information is not available or private information is made public)	**6.06**	4.36	5.36	5.38
N	17	11	11	39

Table 2. Three CSFs that were rated significantly different on their importance for BPMS implementation, by respondents with three levels of BPM experience

As can be seen, respondents with lesser experience rate CSF5 and 8 significantly lower compared the other respondents, while they rate CSF 55 significantly higher than the other groups. The fact that respondents with more than 5 years of experience find CSF5 (*alignment of a BPMS implementation to the organizations strategy*) and CSF8 (*an organizations culture will influence the success of a BPMS project*) significantly of more importance, confirms that typically these factors are 'seen' by professionals who have experience and knowledge about more and different BPMS projects. If we look at the absolute scores of the CSFs in Table 2, it is remarkable to see that factor 55 is the highest rated factor by those with 5 years or less experience. The respondents with between 5 to 10 years experience rate CSF5 (*the BPMS effort should be aligned to the organizations strategy*) as the highest of all factors, followed by CSF4 (*strong management support and involvement is needed* and then CSF8. The most experienced respondents have rated CSF8 highest of all factors. This confirms the notion that professionals that are involved in BPMS implementations tend to pay more attention to technical factors when they are less experienced. Throughout the years, when professionals experience project failures, insufficient project and change management, or misalignment with the organizational strategy are experienced as more important and critical factors. This explains that the most experience professionals judge as the most important CSF when implementing a BPMS the fact that an *'organizations culture which will influence the success of a BPMS project'*. As a consequence, we also need to conclude that it is very hard to predict the success of a BPMS implementation at the start of the project because changing an organizations culture is a long term and very difficult effort (Kotter, 1996).

CONCLUSION

In this paper we presented the results of an international research conducted through a web survey and an online 'game' to judge CSFs for BPMS implementations. The survey was completed by 39 professionals from 11 different countries. Via the 'game' application, respondents were asked to place 55 cards, each holding a description of a CSF for BPM-systems implementation, onto a two-dimensional 'board' containing 35 cells. By placing a card, a CSF was simultaneously assigned to (1) one of the five domains that can be distinguished for BPMS implementation, and (2) their importance or significance for BPMS implementations (ranging from very insignificant to very important).

Based on the collected data it was possible to make a distinction between the different cultural areas the respondents are employed in, and their level of experience within the BPM domain. A first interesting result is that overall these different groups mostly share a common view on the five domains to which CSFs belong. Only respondents with a high level of experience deviated from the average, as they believe that the aspect of project management during a BPMS implementation is significantly more important than other aspects. Furthermore, if we look at the importance rating of the CSFs, depending on the national/cultural background or the level of experience of the respondents some significant differences can be found. A first interesting finding is the differences between the professionals from the Anglo- and Nordic countries on factors like: *understanding the BPM concept,* having *strong management support and involvement,* the need for *the BPM(S) implementation to start within the organization before external processes and systems are included* and *understanding how processes and data are linked together.* These CSFs seem to be more important for BPM professionals that act in Northern European countries compared to those in the United States, United Kingdom and Canada. It remains difficult to say whether this can be explained by the different scores that these regions have on the cultural dimension as determined by Hofstede, although this is worth exploring further. A second finding is that respondents with more experience in BPMS implementations tend to find the 'soft' or intangible CSFs more important than others, in particular the CSFs *alignment of the implementation to the organizations strategy*, *strong project management* and the *influence of culture on the success of a BPMS project.* This implies that organizations that start implementing BPMS, in the longer run, will be confronted with the fact that it is not mainly an IT-project but a project that should be aligned to the strategic goals of the business. It also implies that BPMS projects are of strategic importance and should preferably be initiated and constantly supported by the top management within the organization. Finally, the answers of the most experienced BPM professionals support the notion that organizational culture plays a vital role in the success of a BPMS implementation as BPM coincides with fundamental changes within an organization. In conclusion, this research supports BPM consultants and project members to specify the critical success factors for BPMS projects and anticipate on these

DISCUSSION AND FURTHER RESEARCH

The objective of this research was to find how BPM-systems success factors are perceived by professionals from different countries and with different levels of experience within the BPM domain. Although in this research significant differences were found between cultural backgrounds, as well as between levels of experience, the number of respondents is quite limited to draw ultimate or generic conclusions. Therefore this research can primarily be considered as explorative. To generate as much input as possible it was decided to keep it open online, not using any type of sampling.

We suggest that future research can focus on professionals from other cultural groups, such as Asian and South American countries. Also, it can be useful to analyze whether there are differences between different sectors or between different groups of functions/roles of the respondents..Finally, the list of 55 SCFs can be revalidated and investigated on validity, reliability and multicolinearity. This can result in a shorter and more effective list of SCFs for BPMS implementations.

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APPENDIX 1 – CRITICAL SUCCESS FACTORS INCLUDED IN RESEARCH

CSFid	Description	Sig. Culture differences	Sig. Years of experience
1	Know-how and experience with Project Management	**0.000**	0.189
2	Experience with Change Management	**0.018**	0.146
3	Understanding the Business Process Management concept	**0.021**	0.135
4	Strong management support and involvement is needed	**0.050**	0.051
5	The BPM(S) effort should be aligned to the organizations strategy	0.157	**0.034**
6	Taking into account governance & accountability is crucial	0.624	0.541
7	Training BPM(S) project members and end users is essential	0.072	0.317
8	An organizations culture will influence the success of the BPM(S) project	0.064	**0.017**
9	The customers, industrial partners and the target environment should be involved in the project	0.342	0.198
10	Challenging roles and new job perspectives should be created for after the project	0.160	0.896
11	Establishing a support organization is vital to ensure ongoing maintenance and management of processes	**0.014**	0.079
12	The project should aim at creating value for all stakeholders, irrespective of geography or organizational boundaries	0.226	0.152
13	The BPM(S) effort should build a knowledge base around processes	0.208	0.056
14	The BPM(S) implementation should start within the organization before external processes and systems are included	**0.009**	0.506
15	A BPM(S) project should use best practices	0.166	0.777
16	Understanding the processes of the company	0.106	0.365
17	Using the 'best' modeling standards and techniques	0.735	0.723
18	A well organized design (modeling) phase	0.414	0.549
19	Well organized maintenance and (quality) control of the process models	0.672	0.704
20	When activities / (sub)processes are changed, the correct operation of the overall process should be tested	0.496	0.613
21	Strategic objectives and functional objectives should be identified in the BPM(S) project and be linked to process models	0.407	0.860
22	Availability of documentation of embedded processes in application systems is important	0.407	0.128
23	A BPM(S) project should offer multi process adaptation alternatives, and also a contextual adaptation process	0.252	0.810
24	Take into account the difficulty in integrating offshore-supplier employees into the processes and the workflows of their companies	0.517	0.800
25	The software systems interfaces should be modeled	0.703	0.208
26	Pre-determine the collaboration choreography of participating organizations and rule out ad hoc changes	0.644	0.287
27	Understanding interdependencies and integration of data sources	0.417	0.776
28	Finding process related information	0.183	0.470
29	The organization needs to be process orientated	0.599	0.358

30	Knowledge on defining and using (web) services needs to be available	0.448	0.690
31	The organization and people involved should fully understand the BPM(S) concept	0.666	0.424
32	The business and IT departments need to work closely together	0.236	0.622
33	A BPM(S) project should also use/involve business rules	0.084	0.794
34	Information-processing work should not be subsumed into the real work that produces the information	0.491	0.668
35	For global inter-operability, transparency to the end user is needed where this has consequences for the information availability	0.116	0.152
36	The IT-infrastructure should be aligned to the developed solution	0.526	0.104
37	Embedded business logic within communications networks need to be taken into account	0.878	0.220
38	Understanding how processes and data are linked together	**0.010**	0.411
39	Understanding how to use the concept of (web) services	0.926	0.896
40	A 1-on-1 transformation of design models into implementation (runtime) models is important	0.836	0.867
41	First finish the process analyses and engineering before evaluating technology to be used	0.625	0.246
42	The service orientated architecture should be based upon applications from large IT vendors	0.622	0.241
43	Reliability of Internet (standards) should be taken into account	0.592	0.846
44	Process managers/workers should not get direct access to the application server where connections are running	0.567	0.570
45	Testing of prototypes and the final process solutions should be performed	0.264	0.960
46	The inflexibility of IT application systems should be taken into account	0.321	0.918
47	Involving the right people in the project	0.166	0.466
48	Having a set of key performance indicators and measuring the change (improvement)	0.500	0.445
49	Ensuring that the BPM project is part of a continuous optimization effort	0.818	0.161
50	Creating a culture of attention to quality within the organization	**0.047**	0.216
51	Use multiple data gathering approaches	0.596	0.661
52	The availability of data within the Supply Chain is critical	0.603	0.934
53	Both formal and informal monitoring and reporting activities should be taken into account	0.401	0.294
54	Capture information once and at the source (tasks are performed wherever it provides the most value)	0.056	0.233
55	Granularity and visibility control should be managed (to rule out that information is not available or private information is made public)	0.121	**0.011**