A Study into the Critical Success Factors When Implementing Business Process Management Systems

Pascal Ravesteyn, University for Applied Science Utrecht, Institute for Process Innovation, Nijenoord 1, 3552 AS Utrecht, The Netherlands; E-mail: pascal.ravesteijn@hu.nl

1. INTRODUCTION

Nowadays the interest in Business Process Management (BPM) and Service Oriented Architecture (SOA) is rising enormously. There are a lot of software developers and consultancy firms that are jumping to the occasion and are selling Business Process Management Systems (BPMS) that are based on these concepts (Hill, 2006). Hearing these companies talk, it is mostly about 'What' the BPM and SOA concepts are and 'Why' companies should start projects. Often the aim of such projects is turning a company's current application portfolio to a Service Oriented Architecture that can make the business more agile by using Business Process Management concepts and putting the business in the lead where it concerns the use of IT.

Business Process Management Systems are based on developments in both the business and IT domain (figure 1). First, two major business trends that relate to BPM are Total Quality Management (TQM) and Business Process Reengineering (BPR) (Deming 1982, Hammer and Champy 1993). Second, we can identify a rise in the implementation and use of new types of information systems like Enterprise Resource Planning (ERP) systems, Workflow Management (WFM) systems, advanced planning systems and so on. What once started as the automation of a company's internal processes has now become digitization of supply chains (Davis and Spekman 2003). One of the key contributors to this has been the Internet and the associated network standardization.

Because existing methods to implement management concepts were not equipped to handle complicated IT developments as part of a project (Kettinger et al, 1997), and IT implementations started to impact the way in which business were run more and more, all these trends slowly converged into new types of information systems, that some (Smith and Fingar 2003) call Business Process Management Systems (BPMSs). A BPMS can be defined as "a generic software system that is driven by explicit process designs to enact and manage operational business processes" (Weske et al. 2004).

Due to the fact that both BPM and SOA are relatively new concepts, for the business as well as the IT world, the before mentioned emphasis on the 'What' and 'Why' is to be expected. But looking from a customer's perspective, i.e. a company that wants to start a BPM and SOA project and is gathering information for this purpose, the 'How' is most important. Especially if we keep in mind the list of failed ERP implementations during the fifteen or so years. Unfortunately most vendors and resellers largely neglect the implementation aspect, and companies that do claim to have an implementation methodology on BPMS are scarce. In most cases regular software development methodologies or project management principles are used to implement BPM and SOA. The reason for this is that most software developers and consultancy companies regard the implementation of a BPMS as a software development project; which even from a SOA perspective is no longer true (Krafzig et al. 2005). These companies use existing methodologies for software development such as the waterfall method, rapid application development (RAD) or rational unified process (RUP). By doing this, they ignore the business side of a BPMS implementation such as process analysis, performance measurement and continuous (quality) improvement. To cope with this, companies regularly use the Prince 2 project management methodology. Although this may sound like a good implementation approach it is far from tested and validated.

Figure 1. Emergence of business process management systems

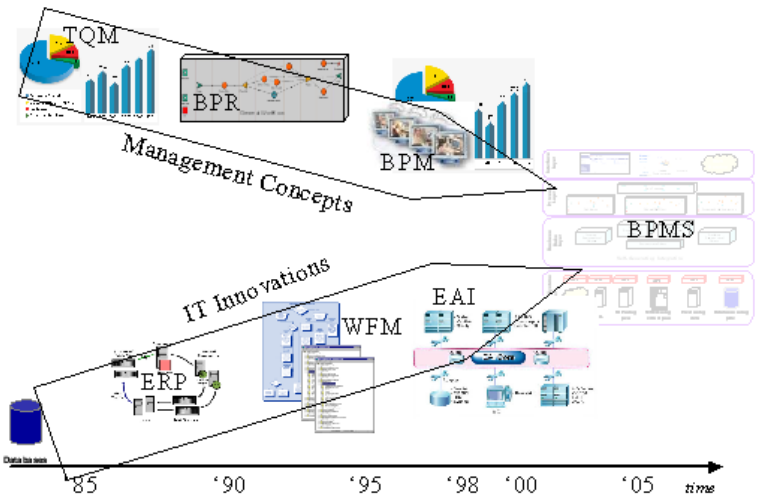
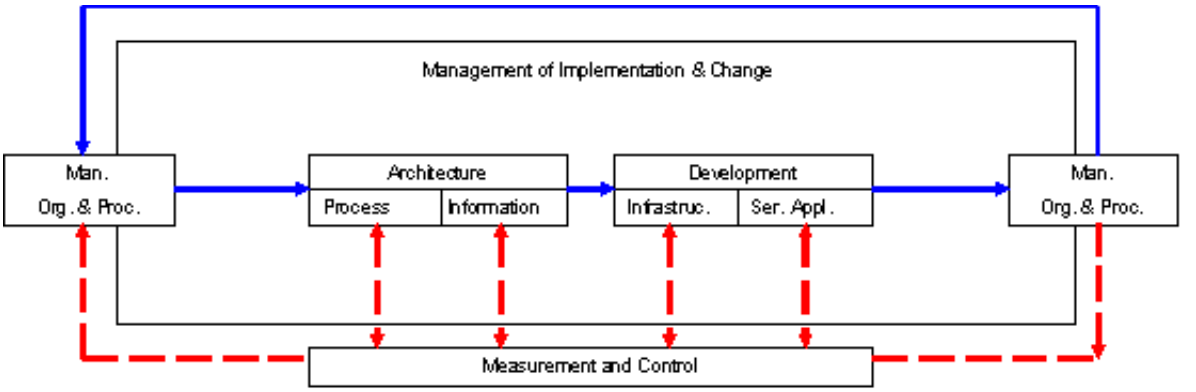


Figure 2. BPMS implementation framework



2. RESEARCH APPROACH AND PRELIMINARY FINDINGS

Based on what we have seen so far, it is possible to state that currently there are no proven implementation methods for a BPM and SOA project. In this paper it is argued that a different implementation paradigm is needed for the implementation of a Business Process Management System. A literature study of 104 articles and books[1] was conducted and based on a meta-analysis of the literature a list was compiled with over 337 critical success factors from the different background principles of BPMS (as depicted in figure 1). This list was based upon the principles according to the following composition: 3.86% of the factors came from TQM, 17.51% from BPR, 29.97% BPM, 11.57% WFM, 12.76% EAI, 2.08% BAM, 12.17% from the BPMS domain and 10.08% from various other related areas. Factors relating to SOA are not mentioned separately but as part of the EAI and BPMS.

Based on the list of critical success factors, a distinction is made between factors that are mentioned in only one domain, and factors that are common among more domains. For example, quantitative measuring and use of statistics to control the effectiveness of improvement actions is only mentioned in relation to TQM, while the importance of top management support is mentioned throughout almost all domains. Next, the frequency a success factor was mentioned is recorded to determine if a ranking or weight can be attached to the factors. Finally, a clustering is made in the following 5 themes that are partially based on the business and IT alignment model of Scheper (2002).

1. Management of Organization and Processes;
2. Architecture Design;
3. Developing an IT Solution based on SOA;
4. Management of Implementation and Change;
5. Measurement and Control.

Within these themes the 'architecture design' is subdivided into designing a process model and an information model, and the 'developing an IT Solution' consists of the realization of an infrastructure and the development of services oriented business applications.

Based on the ranking of the critical success factors a top three per theme can be given:

1. Understanding the BPM concept, management involvement, and strategic alignment;
2. Understanding the process, quality of modeling technique, and quality of data sources;
3. Managing process integrity, granularity of services, and integration of existing applications via services;
4. Quality of project management, change management, and involving people;
5. Defining performance metrics, availability of data, and organizing for continuous optimization.

3. IMPLEMENTATION FRAMEWORK

Based on the outcome of the literature study a BPMS implementation framework is developed that shows the most important aspects that should be part of a BPMS implementation methodology (see figure 2). When implementing a BPMS it is important to understand the underlying principles of Business Process Management and Service Oriented Architecture. It should also be clear that a BPMS implementation is a continuous process consisting of many different projects. This continuous character is shown in the framework by the blue line.

Furthermore the framework distinguishes three different areas, (1) the ongoing domain of the business organization itself, (2) the measurement and control function and (3) the BPMS implementation project area. In most cases a business that wants to implement BPMS will already have an established organization with running processes, which then will be the starting point for the implementation. Also, any business that is already in operation will have some type of measurement and control function. For small businesses this will probably be only the accounting function. For medium and large organizations other functions will provide information about the organization and processes, such as a quality department etc. To succeed in implementing a BPM and SOA there should be sufficient measurement information available about the processes that are going to be modeled. If this is not the case, the implementation should not be started. Metrics on processes are important to be able to continuously measure the effects of any changes.

The BPMS implementation area consists of two phases, the 'architecture design' phase and the 'development phase'. In the first phase a process and information architecture should be developed, i.e. the business process management part. Subsequently, this can be used in the realization of the technical infrastructure and creation of service oriented business applications, both part of the second phase. The two phases are supported by project and change management simultaneously because applying the BPM and SOA paradigm implies that while working on a project there can already be changes in processes and IT applications. The BPMS implementation can be regarded as a project or series of small projects as long as it is understood that both the organization and its processes and the measurement and control function are in fact just a small part of the project.

4. CONCLUSION

The first findings from this study suggest that a BPMS implementation should take into regard both the different management concepts and IT Innovations on which it is funded. To do so, BPMS implementations should start with the business objectives, processes and the metrics by which they are measured from the management side. These processes should then be aligned to a company's strategy and if necessary be (re)designed before starting to identify and develop services as part of a SOA.

The critical success factors that are derived from the different background principles to BPMS are expected to influence the outcome of a BPMS implementation. Based on these factors it is advocated to use aspects of both implementation methodologies for management concepts such as TQM and BPR, and software

development principles. The proposed framework shows the continuous nature of BPMS and is based on the concepts from both business and IT.

5. DISCUSSION AND FUTURE RESEARCH

In this paper a first attempt at is made at describing how a BPMS implementation is different than the implementation of a management concept or the development of an IT application. It can be argued whether such an implementation is really different from any other software implementation. Therefore further research should be done to have this notion validated.

Also the constructed framework is based mostly on the outcomes of the literature study. Comparisons to other implementation frameworks should be done to determine if there is no better-validated alternative already available.

At this stage the research focusing on comparison of the developed framework to others. Simultaneously a series of interviews (approximately 25) are held at Dutch consultancy firms, software developers and organizations that have implemented a BPMS to validate both the critical success factors that were found and the proposed framework. When an improved framework is available several case studies will be held to further validate and test the practical applicability.

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ENDNOTE

[1] A complete list is available upon request