

2010

Collaborative Business Process Management: Exploring Themes, Achievements, and Perspectives

Bjoern Niehaves

University of Muenster, bjoern.niehaves@ercis.uni-muenster.de

Ralf Plattfaut

University of Muenster, ralf.plattfaut@ercis.uni-muenster.de

Follow this and additional works at: <http://aisel.aisnet.org/ecis2010>

Recommended Citation

Niehaves, Bjoern and Plattfaut, Ralf, "Collaborative Business Process Management: Exploring Themes, Achievements, and Perspectives" (2010). *ECIS 2010 Proceedings*. 30.

<http://aisel.aisnet.org/ecis2010/30>

This material is brought to you by the European Conference on Information Systems (ECIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2010 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.



Collaborative Business Process Management: Exploring Themes, Achievements, and Perspectives

Journal:	<i>18th European Conference on Information Systems</i>
Manuscript ID:	ECIS2010-0345.R1
Submission Type:	Research Paper
Keyword:	Business process management, Networks, E-collaboration, IS research agenda



COLLABORATIVE BUSINESS PROCESS MANAGEMENT: EXPLORING THEMES, ACHIEVEMENTS, AND PERSPECTIVES

Niehaves, Björn, European Research Center for Information Systems, Leonardo-Campus 3,
48149 Muenster, Germany, bjoern.niehaves@ercis.uni-muenster.de

Plattfaut, Ralf, European Research Center for Information Systems, Leonardo-Campus 3,
48149 Muenster, Germany, ralf.plattfaut@ercis.uni-muenster.de

Abstract

Under labels such as global value chains, global production networks, interconnected firms, or outsourcing cross-boundary business processes have gained significant attention in practice and research. However, only little research has yet systematically examined the implications of cross-boundary business processes for Business Process Management (BPM). These cross-boundary business processes together with the drivers of collaboration and network management as well as governance form one of the key challenges for today's BPM research. In this study we thus systematically review literature and seek to answer whether BPM research in Information Systems (IS) has yet embraced and explored the concept of collaboration. We find that collaborative BPM is a growing trend in IS research, but that there still exist significant research gaps. Therefore, we propose a research agenda that points at potentially fruitful directions for future research.

Keywords: business process management, collaboration, literature review.

1 INTRODUCTION

Significant developments in management, economics, and organization have fueled the study of organizational boundaries (Newell et al. 2001). Major drivers include, for instance, the increasing importance of global value chains (Gereffi et al. 2005, Sia et al. 2008) and production networks (Sturgeon 2002), of interconnected firms (Lavie 2006), collaboration dynamics (Chen et al. 2008, Katila & Mang 2003), outsourcing (Walsh & Deery 2006), and the increasing potential of information systems (Phelps 2007). While the boundary phenomenon has already been intensively studied on the level of the business processes as in supply chains or inter-organizational systems (Ashkenas et al. 1995), little research has yet systematically examined the implications of boundary-blurring business processes for Business Process Management (BPM). So far, research in BPM acknowledges that boundaries are blurring in BPM as managing collaboration, networks, and governance is becoming increasingly important and can be regarded a key challenge to BPM research and practice (Rosemann et al. 2006). Also, early in the development of business process-oriented management, it was recognized that BPM projects can only be effective if BPM teams are made up of people from both inside and outside of the organization (Hammer & Champy 1993). However, literature does not yet systematically provide theory, models, vocabulary, and frameworks (den Hengst & de Vreede 2004) to a sufficient extent in order to understand BPM collaboration (Feller et al. 2008, von Hippel 2001, Walsh & Deery 2006).

Collaboration [*Latin: com=together, laborare=to labor, to work*] is a concept widely used in information systems (for instance, Bjorn & Ngwenyama 2009, Kumar & van Dissel 1996, Majchrzak et al. 2005, Munkvold 1999). Also, BPM maturity research indicates that BPM collaboration with actors from inside and especially from outside an organization's boundaries will be a major challenge that still lies ahead for most firms. Here, we argue that in order to get a better hold of the phenomenon, we need further conceptual differentiation and introduce two theoretical "idealtypes" (Weber 1949) of collaborative BPM distinct in the degrees of collaboration: 1) Non-collaborative BPM associates with one or more single individuals that conduct non-coordinated efforts to reflect on and to alter business processes. 2) Collaborative BPM describes coordinated initiatives that involve actors from inside or from outside a defined entity. Here, we define the entity of analysis being the formal legal organization (the firm). Hence, these concepts specify prior theoretical perspectives on the collaboration phenomenon: collaboration addresses questions of working together while the two concepts elucidate the set and the relationship of actors involved. This paper thus poses the research question:

RQ1: To what extent has BPM literature yet embraced/articulated/explored the concept of collaboration?

RQ2: Which areas could provide potentially fruitful avenues for future research on collaborative BPM?

Accordingly, we make the following contributions. First, we develop a conceptual framework for understanding collaborative BPM. Second, we review relevant literature and identify trajectories and shortcoming. Third, we discuss potentially fruitful avenues for future research on collaborative BPM. Hence, we address all three reasons for systematic literature re-views proposed by Kitchenham (2004).

Against this background, the remainder of the paper is structured as follows. First, we will provide basis theory background by conceptualizing BPM and BPM collaboration. After setting out the literature review methodology, we then present and discuss the results of our literature analysis. The last sections are concerned with implications for future research, conclusions, and limitations.

2 THEORY BACKGROUND

2.1 Business Process Management

BPM has its roots in Business Process Reengineering (BPR) and Total Quality Management (TQM). On the one hand, the concept of BPR emerged within a Massachusetts Institute of Technology's management research program that examined the role that IT would play in organizations in the 1990s (Peppard & Fitzgerald 1997). Early publications (Davenport & Short 1990, Hammer 1990) emphasized that BPR projects are radical, revolutionary, and a one-time undertaking (Hung 2006, Zairi & Sinclair 1995). While both BPR and TQM have in common the focus on improving organizational processes, TQM on the other hand is considered a rather incremental, evolutionary approach aiming at continuous improvement (Hung 2006, Zairi & Sinclair 1995). However, most literature in business process research recognizes that both concepts have to be viewed as complementary integral parts of a process-oriented strategic management system (Corbitt et al. 2000, Davenport 1993, Hung 2006, Martinsons & Hempel 1998, Zairi & Sinclair 1995). For example, Kettinger et al. (1997, p. 56) argue on BPR that "[r]ather than a 'quick fix', BPR is increasingly recognized as a form of organizational change characterized by strategic transformation of interrelated organizational subsystems".

Against this background, we view BPM as a management approach that applies concepts of both punctuated and incremental change. This perspective is supported, for instance, by Armistead & Machin (1997) who argue that BPM is "concerned with how to manage processes on an ongoing basis, and not just with the one-off radical changes associated with BPR". Accordingly, BPM can be considered a holistic approach to the way in which organizations are managed (Armistead & Machin, 1998, Rosemann et al. 2006). Within this paper, we therefore understand BPM as a set of recurring projects that aim at the continuous change of organizational procedures (for focus on change aspects see, for instance, Kettinger et al. 1997, Lyytinen & Newman 2008, Sarker et al. 2006). For that reason, BPM projects should be considered as being embedded in a relatively stable structural organizational setting and do not imply, for instance, business process re-definition in the move of company mergers. The focus of BPM projects can range from purely organizational to more technical perspectives (Rosemann et al. 2006, Stohr & Zhao 2001), the latter especially in the course of information systems implementations (for an overview on the relationship between information systems and the innovation of business processes see Tarafdar & Gordon 2007).

2.2 Collaborative Business Process Management

Organizational boundaries constitute a central phenomenon in management and organization research. Despite problems of their operational measurement, at their core, organizational boundaries describe "the walls of an organization", most commonly described as the realms of a formal structure, the firm (for a comprehensive theory discussion see Santos & Eisenhardt 2005). The concept has been studied for decades and is considered one of the most important concepts in organizational research (for instance, Aldrich 1971, Mosakowski 1991, Santos & Eisenhardt 2005). Grand trends in management, economics, and organization have revitalized and fuelled the study of organizational boundaries (Newell et al. 2001). Drivers include the increasing concern of global value chains (Gereffi et al. 2005, Sia et al. 2008) and production networks (Sturgeon 2002), of interconnected firms (Lavie 2006), collaboration dynamics (Afuah 2001, Katila & Mang 2003), outsourcing (Walsh & Deery 2006), and of developments in information systems (Phelps 2007). Reflecting such developments, Ashkenas et al. (1995) argue the model of the boundaryless organization. Conceptually, an organization has external boundaries that separate it from actors outside of the organization, such as its suppliers and customers (Staber 2004), and internal boundaries that present demarcation of departments. In a boundaryless organization the goal is to develop greater flexibility and responsiveness to change and to enable the free exchange of information and ideas (Ashkenas et al. 1995). The authors argue that a boundaryless organization

behaves more like an organism promoting better integration and closer partnerships with suppliers and customers. Such view is animadverted however, for just strikingly ignoring the factual existence of the boundary phenomenon and critics (for instance, Newell et al. 2001) identify the need for a realistic and mature treatment of organizational boundaries. Building on these arguments, we acknowledge that businesses processes are highly cross-organizational, but we recognize the existence of organizational boundaries. In order to address Newell et al.'s (2001) call for a mature treatment of this phenomenon, we suggest to differentiate between the presence and effects of organizational boundaries, first, on the level of business processes (work system level) and, second, on the level of business process management (build system level). On the work system level, businesses activities are executed and given organizational structures and procedures are utilized (see Alter 2002, Bergman et al. 2002, Lyytinen & Newman 2008, Mumford, 2003). These structures and procedures are designed by a (separate) build system, a system that commands a set of resources and enacts routines to carry out the change and addresses the issues of uncertainty, ambiguity, and complexity (Lyytinen & Newman 2008, Lyytinen et al. 1996). The differentiation between, first, the conduct of business processes (work system) and, second, the management of business processes (build system) opens up for a more detailed argument on organizational boundaries.

The emergent theme of collaboration in BPM reflects the trend of boundary-blurring business processes. We identify that a large body of research has focused and identified trends of boundary-blurring on the level of business processes (Afuah 2001, Gereffi et al. 2005, Katila & Mang 2003, Lavie 2006). Concurrently, research acknowledges that boundaries are also blurring on the level of BPM as managing BPM collaboration, networks, and governance seems to become increasingly important and can be regarded a key challenge to BPM research and practice. Early in the development of business process-oriented management, it was recognized that BPM projects can only be effective if BPM teams are made up of people from both inside and outside of the organization (Hammer & Champy 1993). Internal and external orientation and learning have long been considered success factors for BPM projects (Al-Mashari & Zairi 1999, Davenport & Short 1990).

The task of managing collaboration in BPM becomes increasingly important. Managing BPM networks is an integral part of the maturation of an organization in its BPM activities (Fisher 2004, Rosemann et al. 2006). Often, business processes are too narrowly defined – meaning: “ending” at the organizational boundaries –and relevant stakeholders (Freeman 1984) not included in BPM projects (Ahmad et al. 2007, Rosemann et al. 2006). According to research on BPM maturity, the effective collaboration with the (external) stakeholders of an organization (such as customers, suppliers, or distributors) in its BPM projects is an integral characteristic of organizations with high BPM maturity, of “intelligent operating networks” (Fisher 2004). The stimulation, the management, and the exploitation of BPM networks and collaboration can be regarded as a key challenge to the practice of organizational BPM. Too, Chesbrough (2003) argues that organizations need to explore new pathways to systematically make use of know-how that lies outside of an organization's boundaries through new forms of collaboration (see also Feller et al. 2008, von Hippel 2001, Walsh & Deery 2006). Here, our paper seeks to assess current achievements as well as research gaps in IS-related BPM literature in order to open up for an informed discussion of future research potential.

3 METHODOLOGY

Scope of Literature Review. In order to review the literature on collaborative BPM we followed Webster & Watson's approach for reviewing literature (2002): After the search of the literature, we derive the major concepts from the articles. This allows for analyzing and comparing the papers and for identifying fields of further research. In terms of Cooper's taxonomy (1988) we analyze and integrate the research outcomes of articles out of the IS domain on collaborative BPM. The review is organized in a conceptual manner and addresses specialized and general scholars. In the whole process we try to employ a neutral perspective. The scope of our literature review cannot be labeled exhaustive, as we

only used one database for the database search and restricted ourselves to the 8 major journals in our field. However, we hope that the literature search process can be called representative for the IS domain.

Search Process. In order to identify literature on collaborative BPM we employed a three-staged approach which is documented according to vom Brocke et al. (2009):

1) At first we searched the Senior Scholars' Basket of Journals published by the Association for Information Systems (AIS). It consists of the eight "top journals in our field", namely European Journal of Information Systems (EJIS), the Information Systems Journal (ISJ), Information Systems Research (ISR), Journal of the AIS (JAIS), Journal of Management Information Systems (JMIS), MIS Quarterly (MISQ), Journal of Strategic Information Systems (JSIS), and Journal of Information Technology (JIT) (AIS 2009). We used the term ("business process*" AND (management OR engineering OR BPM OR BPR OR BPE) AND (collabora* OR coopera*)) to search through the title, abstract and keywords of all articles published in the respective journals in order to find all articles dealing with cooperative or collaborative business process management or (re-)engineering. Moreover, we did not restrict our literature search according to time. The title and abstract of each hit was manually read by both authors to find out whether it is relevant for this study. As a result of this journal-based search, we were able to identify two relevant articles (marked with "journal-based search" in the Appendix) while another four were discarded as being irrelevant for the present study.

2) Our second step in finding literature was a database search. We employed the above mentioned search term in ISI Web of Knowledge's Web of Science (which covers more than 11,000 journals from multiple fields) in order to find more articles in other journals (and journals outside our field as suggested by Webster and Watson (2002)). Once again, we did not employ a time restriction. In our database search we found 150 articles. The title and abstract of every single article were scanned by the authors. This procedure led to additional 23 articles (marked with "database search" in the Appendix).




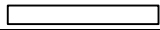



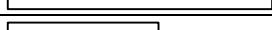
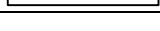
Year	Nr.	Frequency
Pre 1999	0	
1999	2	
2000	1	
2001	0	
2002	2	
2003	4	
2004	2	
2005	2	
2006	1	
2007	7	
2008	4	

Table 2. Articles by time

With the first and second step of our literature search we identified 25 relevant articles. Analyzing the time horizon of these 25 articles (Table 1) we can see that collaboration in the context of BPM is a comparably new topic and only emerged 10 years ago; the first article was published in 1999. Moreover, the number of articles being published on this topic is increasing with a peak in 2007 (7 articles).

3) Our third step was a backward search as suggested by Webster and Watson (2002). While analysing the papers listed above, we marked every reference that could be relevant. Moreover, we scanned the reference list of each article for other interesting papers. All papers identified in this third step were read and evaluated as described above. This led to additional 10 papers and one textbook (marked with "backward search" in the Appendix).

4 RESULTS

Following Webster and Watson (2002), we derive concepts from the literature in order to generate a concept matrix. With the purpose of structuring the concepts, we organize them in the classical triad of dimensions out of political and organizational science: polity, politics, and policy (Keman 1999). In these terms polity means the existing framework of rules – the structure. Politics is the process where actors interact with each other in order to develop coalescence and to achieve consensus. The last term, policy, is the result (or the content of the result) of the process. The three dimensions structure, processes, and content can be filled with concepts derived from the papers we reviewed.

A) Structure. For the structure dimension, the articles fall into two complementary levels, the level of business processes (work system level) and the level of BPM (build system level). On the work system level, businesses activities are executed and given organizational structures and cooperative environments are utilized (Alter 2002, Bergman et al. 2002, Lyytinen & Newman 2008). These structures are designed by a separate build system which is a system that commands a set of resources and enacts routines to carry out the change of business activities and organizational or cooperative structures. By this, the build system addresses the issues of uncertainty, ambiguity, and complexity (Lyytinen & Newman 2008, Lyytinen et al. 1996). This differentiation between, first, the conduct of business processes (work system) and, second, the management of business processes (build system) opens up for a more detailed analysis of the literature and constitutes one of the major group of concepts. Moreover, the literature covered in this review deals with several collaboration partners. Therefore we derived a multitude of collaboration partners out of the BPM literature where it is widely accepted that a broad involvement of ‘people’ inside and outside the organization increases the success and acceptance of BPM initiatives (Abdul-Hadi et al. 2005, Hammer & Champy 1993). These collaboration partners inside the organizational boundaries include 1) top management (Bandara & Rosemann 2005, Rosemann et al. 2006), 2) middle management and employees (Abdul-Hadi et al. 2005, Corbitt et al. 2000), and 3) technical specialists (Corbitt et al. 2000). However, as it is also suggested to include external partners in the process of BPM or BPR, we analyzed the literature for the following collaboration partners: 4) lawmakers (Abdul-Hadi & et al. 2005), 5) customers (Hammer 2007), 6) professional organizations (Balzarova et al. 2004), 7) suppliers (Rosemann et al. 2006, Wu 2002), 8) distributors (Rosemann et al. 2006), 9) software consultants (Akhavan et al. 2006), 10) BPM consultants (Abdul-Hadi et al. 2005, Akhavan et al. 2006, Rosemann et al. 2006), as well as 11) other companies (Wu 2002).

B) Process. As for the process perspective on collaborative BPM, the review leads us to the concepts of collaboration scope. According to Jagdev and Thoben (2001), the scope can be distinguished in five classes: 1) Market transactions where the relationship between the parties is strictly transaction based, 2) Noncontractual agreements with a higher level of trust, 3) Contractual agreements as in supply chains or virtual enterprises, 4) Joint ventures, and 5) Integrated companies. This allows us for a comparison of the collaboration process, it can be a process out of the whole continuum from market environment to integrated companies.

C) Content. The main concept in the content dimension named by the papers covered in the review is goals. Based on Rosemann (2003), we were able to derive several purposes of BPM which form the goals dimension of the concept matrix: 1) Documentation and training, where business processes are modeled in order to document the status quo and to be able to train new employees, 2) Process-oriented reorganization following Hammer and Champy (1993), 3) Continuous process management, 4) Certification and auditing to show partner organizations that certain standards are fulfilled, 5) Benchmarking to compare the structure with other organizations, 6) Knowledge Management (KM) to gain increased transparency of knowledge in the organization, 7) Selection, customizing, or implementation of software, so that new software fits the business needs, 8) Workflow Management (WfM) as the automation of processes, and 9) Simulation to find weaknesses in the business processes.

Art.	A) Structure											B) Process					C) Content											
	Level	Collaboration partners										Scope					Goals											
	build	work	1) top management	2) employees	3) technical specialists	4) lawmakers	5) customers	6) professional org.s	7) suppliers	8) distributors	9) software consultants	10) BPM consultants	11) other companies	1) market	2) non-contractual	3) contractual	4) joint-ventures	5) integrated company	1) documentation	2) reorganization	3) continuous PM	4) certification	5) benchmarking	6) KM	7) SW implementation	8) WFM	9) simulation	
1)	x																											
2)	x		x	x	x																							x
3)		x																										x
4)	x																											
5)	x																											
6)		x																										
7)	x		x	x	x																							
8)		x																										x
9)	x																											
10)		x																										x
11)		x																										
12)		x																										
13)	x																											
14)		x																										
15)	x		x	x	x																							
16)	x																											x
17)		x																										x
18)	x		x	x	x																							x
19)	x		x	x	x																							
20)	x		x		x																							
21)	x																											
22)	x	x																										x
23)		x																										x
24)		x																										
25)		x	x																									
26)		x																										
27)		x																										
28)		x																										
29)		x																										
30)		x																										
31)	x		x	x	x																							
32)	x																											
33)	x		x	x																								x
34)		x																										
Σ	17	18	9	9	9	0	16	2	20	19	1	6	0	0	1	23	0	13	4	17	12	0	0	2	2	9	3	

Please confer the Appendix for the corresponding references.

Table 2. Concept matrix

As a result, in the concept matrix three dimensions with four main concepts and a multitude of sub-concepts exist (see Table 2). Here, we analyze the articles with regard to the above stated dimensions, concepts, and sub-concepts. Each article was reviewed by both authors. In some cases it was not possible to find explicit statements on the collaboration partners or on the desired goals. Here, we did not give any information. Moreover, no journal article did explicitly exclude collaboration partners. Therefore, blank cells in the matrix only refer to not-explicitly named partners, scopes, or goals.

Moreover, we found two cases where a group of authors had published two articles covered by this literature review (Adam et al. 2005a, Adam et al. 2005b and Magdaleno et al. 2007, Magdaleno et al. 2008). In both cases we grouped the articles to one single unit of analysis. In five articles we could not locate any collaboration partners (Blanc et al. 2007, Casati & Discenza 2000, Liu & Shen 2003, Ludwig & Whittingham 1999, Silvestro & Westley 2002) and in one article we could not find a collaboration scope (Silvestro & Westley 2002). In addition, two articles do not state the goal of the BPM/BPR effort (Bitici et al. 2003, Cloutier et al. 2001).

Our literature review shows that the concepts are unequally employed by the literature. Regarding the structural dimension (A) roughly the half of all articles concentrate on collaboration on the work level while the rest does really deal with the inclusion of cooperation into the management of business processes. Great differences can be identified regarding the collaboration partners. Most articles concentrate on the “classical” partners outside the organization, i.e. on suppliers, customers, and distributors. Another group of articles deal with inter-organizational collaboration and concentrates on actors as top management, middle management, employees, and technical specialists. However, it is notable that the articles analyze the collaboration with (BPM or software) consultants or professional organizations very rarely. Moreover, we could not find a single article which included other companies or lawmakers into the collaboration network. In the process dimension (B) we notice that the choice of collaboration partners influences the collaboration scope. Most of the articles concentrate on contractual agreements. The underlying network is either a supply chain or a virtual enterprise. Gou et al. (2003) present an example for “research on business process modeling, analyzing, and managing for virtual enterprises,” while e.g. Muckstadt et al. (2001) analyze business processes and note that they “are often not designed properly, both intra- and inter-organizationally, to adapt to evolving supply chain conditions.” Two other articles concentrate on the collaboration with third party logistics providers with existing contractual agreements (Mortensen & Lemoine 2008, Ying & Sang 2005). Only a minority of articles analyzes collaborative BPM inside integrated companies. However, none of the articles discusses collaboration in pure market conditions or in joint ventures and only one analyzes non-contractual agreements as a basis for collaboration in BPM (den Hengst & de Vreede 2004). In the content dimension (C) almost every article can be classified in one of the two following groups: Most of the articles strive for process-oriented reorganization or continuous process management. Some of them have the minor target of documentation and training. The second group is focused on Workflow Management (WfM). These papers mainly analyze how workflows can be used for inter-organizational cooperation. Only three articles discuss simulation and none strives for bench-marking or certification and auditing. Moreover, the concept matrix shows other phenomena when comparing the concepts used over all dimensions. First, the literature discussed the cooperation with consultants in the context of BPM only if the cooperation scope was in integrated companies. Second, cooperative WfM as a goal was only used with external collaboration partners, mainly with suppliers, customers, and distributors.

5 DISCUSSION AND CONCLUSIONS

Our first research question was focussed on the retrospection and asked for the extent current BPM literature explored and discussed collaboration. As we could only find a small number of articles (36) relevant to this literature review and not every concept employed by this literature on collaborative BPM the importance is doubtful, especially considering that ISI Web of Knowledge’s Web of Science lists more than 11,000 journals. In this review we showed that collaboration in the context of BPM is a topic under growing research as the number of papers published is rising, although the total number of journal papers is still comparably low. Inter-organizational and collaborative WfM seems to be a topic of great interest to IS research. Hence, the literature review raised several new research questions which form the research agenda of this review:

- 1) The review showed that issues of certification and auditing in the context of collaborative BPM are not covered by the literature so far. However, standards and certification grant for a certain level of quality and could help collaborating in the context of BPM. It is possible that standardized processes or

process-interfaces help executing processes in ad-hoc collaboration. Therefore a question for future research is: “How can organizations collaborate to meet standards and get certified for their BPM?”

2) Only three articles covered the goal of simulation. However, simulation can help organizations to evaluate their different alternative business processes quantitatively before implementation and, by this, to improve business efficiency (den Hengst & de Vreede 2004). Therefore, the questions “How can collaborative intra- or inter-enterprise processes be simulated?” and “How can simulation be used for optimizing collaborative BPM?” arise for future research.

3) Moreover, in the literature analysis we noted that the inclusion of and collaboration with external parties using non-contractual agreements is not fully covered by the literature. Here, the literature on open innovation which proposes that companies should use external knowledge to develop new products (Chesbrough 2003) could be helpful. However, this approach has not been transferred to BPM and processes so far. Hence, we propose the research question “How can companies make use of their external partners’ knowledge for internal BPM?” This question especially focuses on the build-level of BPM and the cooperation with suppliers, customers, distributors, consultants, and other organizations.

4) Although lawmakers can play an important role in BPR and BPM, the literature covered by our review neglected this collaboration partner. Therefore future research could answer the question: “What role can lawmakers play in collaborative BPM on both build and work level?”

5) Literature offers distinct theory perspectives for understanding collaborative BPM, however, some potentially fruitful theory approaches yet appear to be under-developed. We consider important to investigate into BPM as dynamic capability (Teece et al. 1997, Eisenhardt & Martin 2000, Winter 2003). Here, collaboration can be viewed as a mean to secure the adaptiveness of business processes to a changing environment. Also, it appears fruitful to explain collaborative BPM in view of prior historical events and to extract and take into account factors that led to the evolution of collaboration in BPM initiatives (Lyytinen & Newman 2008). We see that the theory perspectives of dynamic capability and of evolution are interconnected and bear greatest potential for framing and understanding collaborative BPM. Extensive efforts into this direction are not yet to be found in pertinent literature.

Our findings are, however, beset with certain limitations. Although we employed a database search and tried to include different concepts in our search phrase, the literature search can hardly be called exhaustive. On the one hand, this is due to our focus on journal articles. In this literature review we did not include other sources as conference proceedings or books. On the other hand, we did not perform a forward search as suggested by Webster and Watson (2002), and, therefore potentially overlooked newly published articles on the topic. However, we certainly feel confident that our search process provides us with a solid foundation of the relevant body of knowledge. Thus, future research might improve the literature review itself. The literature search could be enhanced to fix the flaws mentioned above. The second area of future research is associated with the research agenda proposed.

REFERENCES

- Abdul-Hadi, N., A. Al-Sudairi, and A. Saleh (2005). Prioritizing Barriers to Successful Business Process Reengineering (BPR) Efforts in Saudi Arabian Construction Industry. *Construction Management and Economics*, 23, 305-315.
- Afuah, A. (2001). Dynamic boundaries of the firm: are firms better off being vertically integrated in the face of a technological change? *Academy of Management Journal*, 44 (6), 1211-1228.
- Ahmad, H., A. Francis, A., and M. Zairi (2007). Business process reengineering: critical success factors in higher education. *Business Process Management Journal*, 13 (3), 451-469.
- Akhavan, P., M. Jafari, and A.R. Ali-Ahmadi (2006). Exploring the Interdependency between Reengineering and Information Technology by Developing a Conceptual Model. *Business Process Management Journal*, 12 (4), 517-534.
- Aldrich, H. (1971). Organizational Boundaries and Inter-Organizational Conflict. *Human Relations*, 24 (4), 279-293.

- Al-Mashari, M. and M. Zairi (1999). BPR implementation process - an analysis of key success and failure factors. *Business Process Management Journal*, 5(1), 87-112.
- Alter, S. (2002). The work system method for understanding information systems and information system research. *Communications of the AIS*, 9 (6), 90-104.
- Armistead, C. and S. Machin, (1997). Implications of business process management for operations management. *International Journal of Operations & Production Management*, 17 (9), 886-898.
- Ashkenas, R.N., D. Ulrich, T. Jick, and S. Kerr (1995). *The Boundaryless Organization: Breaking the Chains of Organizational Structure*, Jossey-Bass, San Francisco, USA.
- Balzarova, M.A., C.J. Bamber, S. McCambridge, and J.M. Sharp (2004). Key Success Factors in Implementation of Process-Based Management - A UK Housing Association Experience. *Business Process Management Journal*, 10 (4), 387-399.
- Bandara W., and M. Rosemann (2005). What Are the Secrets of Successful Process Modeling - Insights From an Australian Case Study. *Systèmes d'Information et Management*, 10 (3), 47-68.
- Bergman M., J.L. King, and K. Lyytinen (2002). Large-scale requirements analysis revisited: the need for understanding the political ecology of requirements engineering. *Requirements Engineering*, 7 (3), 152-171.
- Bjorn, P. and O. Ngwenyama (2009). Virtual team collaboration: building shared meaning, resolving breakdowns and creating translucence. *Information Systems Journal*, 19 (3), 227-253.
- Chesbrough, H. (2003). *Open Innovation – The New Imperative for Creating and Profiting from Technology*. Harvard Business Scholl Press, Boston, USA.
- Cooper, H.M. (1988). Organizing Knowledge Syntheses: A Taxonomy of Literature Reviews. *Knowledge in Society*, 1 (1), 104-126.
- Davenport, T. H. (1993). Need radical innovation and continuous improvement? Integrate process reengineering and TQM. *Planning Review*, 21 (3), 6-12.
- Davenport, T. H. and J. Short (1990). The New Industrial Engineering: Information Technology and Business Process Redesign. *Sloan Management Review*, 31 (4), 11-27.
- Eisenhardt, K.M. and J.A. Martin (2000). Dynamic Capabilities: What are they? *Strategic Management Journal*, 21 (4), 1105-1121.
- Feller, J., P. Finnegan, and O. Nilsson (2008). We Have Everything to Win: Collaboration and Open Innovation in Public Administration. In *Proceedings of the 29th International Conference on Information Systems (ICIS 2008)*, Paris, France.
- Fisher, D. M. (2004). The Business Process Maturity Model. A Practical Approach for Identifying Opportunities for Optimization. *BPTrends*, 9 (4).
- Freeman, R. E. *Strategic management: A stakeholder approach*. Pitman, Boston, MA, USA 1984.
- Gereffi, G., J. Humphrey, and T. Sturgeon (2005). The governance of global value chains. *Review of International Political Economy*, 12 (1), 78-104.
- Hammer, M. (2007). The Process Audit. *Harvard Business Review*, 85 (4), 111-123.
- Hammer, M. (1990). Reengineering Work: Don't Automate, Obliterate. *Harvard Business Review*, 68 (4), 104-112.
- Hammer, M. and J. Champy (1993). *Reengineering the Corporation: A Manifesto for Business Revolution*, Harper Business Press, New York, USA.
- Hung, R. Y.-Y. (2006). Business Process Management as Competitive Advantage: A Review and Empirical Study. *Total Quality Management*, 17 (1), 21-40.
- Jagdev, H.S. and K.-D. Thoben (2001). Anatomy of enterprise collaborations. *Production Planning & Control*, 12 (5), 437-451.
- Katila, R. and P.Y. Mang (2003). Exploiting technological opportunities: the timing of collaborations. *Research Policy*, 32 (2), 317-332.
- Keman, H. (1999). Political Stability in Divided Societies: A Rational-Institutional Explanation. *Australian Journal of Political Science*, 34 (2), 249-268.
- Kettinger, W. J., J. T. C. Teng, and S. Guha, (1997). Business Process Change – A Study of Methodologies, Techniques, and Tools. *MIS Quarterly*, 21 (1), 55-80.
- Kitchenham, B.A. (2004). *Procedures for Undertaking Systematic Reviews*, Joint Technical Report, Computer Science Department, Keele University and National ICT Australia Ltd.

- Kumar, K. and H.G. van Dissel (1996). Sustainable collaboration: Managing conflict and cooperation in interorganizational systems. *MIS Quarterly*, 20 (3), 279-300.
- Lavie, D. (2006). The competitive advantage of interconnected firms: an extension of the resource based view. *Academy of Management Review*, 31 (3), 638-658.
- Lyytinen, K. and M. Newman (2008). Explaining Information Systems Change: A Punctuated Socio-Technical Change Model. *European Journal of Information Systems*, 17 (4), 589-613.
- Lyytinen, K., L. Mathiassen, and J. Ropponen (1996). A framework for software risk management. *Journal of Information Technology*, 11 (4), 275-287.
- Majchrzak, A., A. Malhotra, and R. John (2005). Perceived individual collaboration know-how development through information technology-enabled contextualization: Evidence from distributed teams. *Information Systems Research*, 16 (1), 9-27.
- Martinsons, M. G. and P.S. Hempel (1998). Chinese business process re-engineering. *International Journal of Information Management*, 18 (6), 393-407.
- Mosakowski, E. (1991). Organizational Boundaries and Economic-Performance – An Empirical Study of Entrepreneurial Computer Firms. *Strategic Management Journal*, 12 (2), 115-133.
- Mumford, E. (2003). *Redesigning Human Systems*, Idea Group Publishing, New York, USA.
- Munkvold, B.E. (1999). Challenges of IT implementation for supporting collaboration in distributed organizations. *European Journal of Information Systems*, 8 (4), 260-272.
- Newell, S., S.L. Pan, R.D. Galliers, and J.C. Huang (2001). The myth of the boundaryless organization. *Communications of the ACM*, 44 (12), 74-76.
- Peppard, J. and D. Fitzgerald (1997). The transfer of culturally-grounded management techniques: the case of business process reengineering in Germany. *European Management Journal*, 15 (4), 446-460.
- Phelps, B. (2007). Electronic Information Systems and Organizational Boundaries. *Technology Analysis & Strategic Management*, 19 (1), 17-29.
- Rosemann, M. (2003). Preparation of Process Modeling. *Process Management*, Eds.: Becker, J., Kugeler, M., Rosemann, M., Berlin, 41-78.
- Rosemann, M., T. de Bruin, and B. Power (2006). A Model to Measure Business Process Management Maturity and Improve Performance. *Business Process Management: Practical Guidelines to Successful Implementations*, Eds.: Jeston, J., Nelis, J., Burlington, 299-315.
- Santos, F. A. and K.A. Eisenhardt (2005). Organizational boundaries and theories of organization. *Organization Science*, 16 (5), 491-508.
- Sarker, S., S. Sarker, and A. Sidorova (2006). Understanding business process change failure: An actor-network perspective. *Journal of Management Information Systems*, 23 (1), 51-86.
- Sia, S.K., C. Soh, and P. Weill (2008). IT Governance in Global Enterprises: Managing in Asia. *Proceedings of the 29th International Conference on Information Systems (ICIS 2008)*, Paris, France.
- Staber, U. (2004). Networking Beyond Organizational Boundaries: The Case of Project Organizations. *Creativity and Innovation Management*, 13 (1), 30-40.
- Stohr, E. A. and J.L. Zhao (2001). Workflow automation: Overview and research issues. *Information Systems Frontiers*, 3 (3), 281-296.
- Sturgeon, T.J. (2002). Modular production networks: a new American model of industrial organization. *Industrial and Corporate Change*, 11 (3), 451-496.
- Teece, D.J., Pisano, G. and Shuen, A. (1997) Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18 (7), 509-533.
- vom Brocke, J.; Simons, A.; Niehaves, B.; Riemer, K.; Plattfaut, R.; Cleven, A.: Reconstructing the Giant: On the Importance of Rigour in Documenting the Literature Search Process. In: *Proceedings of the European Conference on Information Systems (ECIS)*. Verona, Italy, 2009.
- von Hippel, E. (2001). Innovation by User Communities: Learning From Open-Source Software. *Sloan Management Review*, 42 (4), 82-86.
- Walsh, J. and S. Deery (2006). Refashioning organizational boundaries: Outsourcing customer service work. *Journal of Management Studies*, 43 (3), 557-582.
- Weber, M. *The Methodology Of The Social Sciences*, Free Press, New York, USA, 1949.
- Webster, J. and R.T. Watson (2002). Analyzing the Past to Prepare for the Future: Writing a Literature Review. *MIS Quarterly*, 26 (2), xiii-xxiii.

- Winter, S.G. (2003) Understanding Dynamic Capabilities. *Strategic Management Journal*, 24 (7), 991-995.
- Wu, I.L. (2002). A Model for Implementing BPR Based on Strategic Perspectives - An Empirical Study. *Information and Management*, 39 (4), 313-324.
- Zairi, M. and D. Sinclair (1995). Business process re-engineering and process management – a survey of current practice and future trends in integrated management. *Management Decision*, 33 (3), 3-16.

APPENDIX

1a)	Adam, O., A. Hofer, S. Zang, C. Hammer, M. Jerrentrup, and S. Leinenbach (2005b). A Collaboration Framework for Cross-enterprise Business Process Management. Proceedings of the 1 st International Conference on Interoperability of Enterprise Software and Applications (INTEROP-ESA'05), 499-510.	Backward search
1b)	Adam, O., P. Chikova, A. Hofer, S. Zang, and D. Vanderhaeghen (2005a). E-Collaboration Architecture for Customer-Driven Business Processes in Inter-Organizational Scenarios. Proceedings of the 5 th IFIP Conference on e-Commerce, e-Business, and e-Government (13E'2005). Poznan, Poland, 63-77.	Backward search
2)	Adamides, E.D. and N. Karacapilidis (2006). A knowledge centred framework for collaborative business process modeling. <i>Business Process Management Journal</i> , 12 (2006) 5, 557-575.	Backward search
3)	Baina, K., K. Benali, and C. Godart (2006) DISCOBOLE: A service architecture for interconnecting workflow processes. <i>Computers in Industry</i> , 57 (8-9), 768-777.	Database search
4)	Bititci U.S., V. Martinez, P. Albores, and K. Mendibil (2003). Creating and sustaining competitive advantage in collaborative systems: the what and the how. <i>Production Planning & Control</i> , 14 (5), 410-424.	Database search
5)	Blanc, S., Y. Ducq, and B. Vallespir (2007). Evolution management towards interoperable supply chains using performance measurement. <i>Computers in Industry</i> , 58 (7), 720-732.	Database search
6)	Cameron, N.S. and P.M. Braiden (2004). Using business process re-engineering for the development of production efficiency in companies making engineered to order products. <i>International Journal of Production Economics</i> , 89 (3), 261-273.	Database search
7)	Carr, D.K. and H.J. Johansson (1995). Best practices in reengineering. New York.	Backward search
8)	Casati, F. and A. Discenza (2000). Supporting workflow cooperation within and across organizations. Proceedings of the 2000 ACM symposium on Applied computing, Como, Italy, 196-202.	Backward search
9)	Chen, T.-Y., Y.-M. Chen, and C.-B. Wang (2008). A formal virtual enterprise access control model. <i>IEEE Transactions on Systems Man and Cybernetics Part A - Systems and Humans</i> , 38 (4), 832-851.	Database search
10)	Cheung, W.M., P.C. Matthews, J.X. Gao, and P.G. Maropoulos (2008). Advanced product development integration architecture: an out-of-box solution to support distributed production networks" <i>International Journal of Production Research</i> , 46 (12), 3185-3206.	Database search
11)	Choi, Y.H., K. Kim, and C. Kim (2005). A design chain collaboration framework using reference models. <i>International Journal of Advanced Manufacturing Technology</i> , 26 (1-2), 183-190.	Database search
12)	Cloutier, L., J.-M. Frayret, S. D'Amours, B. Espinasse, and B. Montreuil (2001). A commitment-oriented framework for networked manufacturing co-ordination. <i>International Journal of Computer Integrated Manufacturing</i> , 14 (6), 522-534.	Backward search
13)	Corbitt, G.F., L. Wright, and M. Christopolus (2000). New Approaches to Business Process Redesign - A Case Study of Collaborative Group Technology and Service Mapping. <i>Group Decision and Negotiation</i> , 9 (2), 97-107.	Database search
14)	Daneshgar, F. and J. Wang (2007). Validation of the awareness net model for the Australian security investment processes. <i>Knowledge-Based Systems</i> , 20 (8), 736-744.	Database search
15)	Dennis, A.R., T.A. Carte, and G.G. Kelly (2003). Breaking the rules: success and failure in groupware-supported business process reengineering. <i>Decision Support Systems</i> , 36 (1), 31-47.	Backward search
16)	Georgakopoulos, D., H. Schuster, A. Cichocki, and D. Baker (1999). Managing process and service fusion in virtual enterprises. <i>Information Systems</i> , 24 (6), 429-456.	Database search

17)	Gou, H.M., B.Q. Huang, W.H. Liu, and X. Li (2003). A framework for virtual enterprise operation management. <i>Computers in Industry</i> , 50 (3), 333-352.	Database search
18)	den Hengst, M. and G.J. de Vreede (2004). Collaborative business engineering: A decade of lessons from the field. <i>Journal of Management Information Systems</i> , 20 (4), 85-113.	Journal-based search
19)	Hlupic, V., J. Choudrie, and N. Patel (2000). Business Process Re-engineering (BPR): The REBUS Approach. <i>Cognition, Technology & Work</i> , 2 (2) , 89-96.	Backward search
20)	Ho, S.J.K., L.L Chan, and R.E. Kidwell (1999). The implementation of business process reengineering in American and Canadian hospitals. <i>Health Care Management Review</i> , 24 (2), 19-31.	Database search
21)	La Forme, F.-A.G., V.B. Genoulaz, and J.-P. Campagne (2007). A framework to analyse collaborative performance. <i>Computers in Industry</i> , 58 (7), 687-697.	Database search
22)	Liu, D.R. and M. Shen (2003). Workflow modeling for virtual processes: an order-preserving process-view approach. <i>Information Systems</i> , 28 (6), 505-532.	Database search
23)	Ludwig, H. and K. Whittingham (1999). Virtual Enterprise Co-ordinator – Agreement-Driven Gateways for Cross-Organisational Workflow Management. Proceedings of the international joint conference on Work activities coordination and collaboration 1999. San Francisco, California, 29-38.	Backward search
24a)	Magdaleno, A.M., C. Cappelli, F.A. Baiao, F.M. Santoro, and R. Araujo (2008). Towards Collaboration Maturity in Business Processes: An Exploratory Study in Oil Production Processes. <i>Information Systems Management</i> , 25 (4), 302-318.	Database search
24b)	Magdaleno, A.M., R.M. de Araujo, and M.R.S. Borges (2007). Designing Collaborative Processes. Proceedings of the 8th Workshop on Business Process Modeling, Development, and Support (BPMDS'07), Nordheim, Norway.	Backward search
25)	McNulty, T. (2003). Redesigning public services: Challenges of practice for policy. <i>British Journal of Management</i> , 14 (1), S31-S45.	Database search
26)	Mortensen, O. and O.W. Lemoine (2008). Integration between manufacturers and third party logistics providers? <i>International Journal of Operations & Production Management</i> , 28 (4), 331-359.	Database search
27)	Muckstadt, J.A., D.H. Murray, J.A. Rappold, and D.E. Collins (2001). Guidelines for collaborative supply chain system design and operation. <i>Information Systems Frontiers</i> , 3 (4), 427-453.	Database search
28)	Norta, A. and P. Grefen (2007) Discovering patterns for inter-organizational business process collaboration. <i>International Journal of Cooperative Information Systems</i> , 16 (3-4), 507-544.	Database search
29)	Serrano, V. and T. Fischer (2007) Collaborative innovation in ubiquitous systems. <i>Journal of Intelligent Manufacturing</i> , 18 (5), 599-615.	Database search
30)	Silvestro, R. and C. Westley (2002). Challenging the paradigm of the process enterprise: a case-study analysis of BPR implementation. <i>Omega-International Journal of Management Science</i> , 30 (3), 215-225.	Database search
31)	Tarafdar, M. and S.R. Gordon (2007) Understanding the influence of information systems competencies on process innovation: A resource-based view. <i>Journal of Strategic Information Systems</i> , 16 (4), 353-392.	Journal-based search
32)	Vanderhaeghen, D. and P. Loos (2007). Distributed model management platform for cross-enterprise business process management in virtual enterprise networks. <i>Journal of Intelligent Manufacturing</i> , 18 (5), 553-559.	Database search
33)	De Vreede, G.-J. (1997). Collaborative Business Engineering with Animated Electronic Meetings. <i>Journal of Management Information Systems</i> , 14 (1997) 3, 141-164.	Backward search
34)	Ying, W. and D.Y. Sang (2005). Multi-agent framework for third party logistics in E-commerce. <i>Expert Systems with Applications</i> , 29 (2), 431-436.	Database search