Boundary Spanning in Business Process Management: Theoretical Framing and Case Study

Jens Poeppelbuss
Institute for Information Management Bremen, Bremen, Germany., jpoeppelbuss@ifib.de

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Institute for Information Management Bremen (ifib)
University of Bremen, Germany
jpoeppelbuss@ifib.de

ABSTRACT

Based on dynamic capability and boundary spanning theory, this study develops a theoretical framework for collaborative BPM in inter-organizational networks. The framework presents collaborative BPM as an organizational capability that serves for connecting business processes through the purposeful employment of boundary objects (e.g., information systems) and boundary spanners (people) at the interfaces between different network partners. Collaborative BPM itself is also considered to rely on boundary spanners and boundary objects as they are needed to facilitate the cross-organizational sensing, seizing, and implementation of business process changes. The framework is applied in a multiple case study in which the collaborative BPM efforts of three exemplary organizations, which all participate in inter-organizational networks, are analyzed. As for practice, the framework provides a systematic blueprint that organizations can use to reflect on their capabilities for collaborative BPM. As for research, the study provides a theoretical framing from which future studies can depart to explore phenomena related to collaborative BPM.

Keywords

Business process management, boundary spanning, inter-organizational networks, dynamic capabilities, case study

INTRODUCTION

Inter-organizational networks have become "a cornerstone of global competitiveness" (Doz and Hamel, 1998, p. xiii) that organizations must understand and manage with skill and priority. Accordingly, integrating and coordinating cross-boundary business processes are key capabilities of organizations (Levina and Vaast, 2005). Non-harmonized processes of different network partners must connect together despite the absence of the prescriptive power provided by hierarchical control that would be present within a single organization (Niehaves and Plattfaut, 2011; van Liere, Vervest and Konsynski, 2010). Instead, collaborative business process management (BPM) efforts are required in order to ensure that joint offerings can be delivered to the customer in an efficient and effective manner (Hung, 2006; Niehaves and Plattfaut, 2011), considerably increasing the complexity of BPM activities (McAdam and McCormack, 2001; Sun, Zhao, Nunamaker and Sheng, 2006).

Just recently, BPM in general has been described as still "largely atheoretical." (Trkman, 2010, p. 125) In particular, the collaborative management of business processes in networks seems to be a comparatively new and unexplored field that, nevertheless, absorbs increasing interest (Niehaves and Plattfaut, 2011). So far, research in this area has focused on rather formal approaches to supply chain management (SCM). Bititci et al. (2004, p. 257) observe, however, that such SCM methods do not sufficiently address strategic collaboration and synergy along the supply chain so that "the value propositions of the supply chain members are disjointed, focusing on delivering value to the next member in the chain, and not worrying about the overall value proposition that is important to the end customer." In networks we typically find bidirectional interactions and a web of direct and indirect relational ties between the organizations and their employees (Basole and Rouse, 2008). These characteristics force organizations in networks to deal with complex organizational, technological and social issues when framing and better understanding collaborative BPM (Niehaves and Plattfaut, 2011).

Addressing the need to put BPM on a more solid theoretical basis, this study provides an initial theoretical framing for collaborative BPM in networks. It draws from recent works that conceptualize BPM as a dynamic capability (Niehaves, Plattfaut and Sarker, 2011; Trkman, 2010) and extends these works to a network perspective. For this purpose, considerations from dynamic capability theory (DCT) are combined with literature on boundary spanning. The resulting theoretical framework is used to empirically explore the collaborative BPM efforts of three organizations which participate in inter-organizational networks. Thereby, this study contributes to a better understanding of current BPM practices of networked organizations.

THEORETICAL FRAMING

Business Process Management as a Dynamic Capability

Business processes management (BPM) is a management approach that has its roots in a range of practices (vom Brocke et al., 2011), such as Kaizen, Total Quality Management (TQM), Hammer's (1990) ideas of business process reengineering (BPR), and Davenport's (1993) process innovation concepts. Through business processes change and improvement, organizations intend to ensure the effective and efficient execution of activities that are critical to customer satisfaction (Hung, 2006) as well as to create new opportunities for competitive differentiation (Raduescu and Marjanovic, 2011). According to Hammer (1996), a focus on business processes helps organizations to dissolve functional, in-house boundaries as well as the boundaries towards customers and suppliers and, thus, to become dynamic, flexible and focused on customer needs.

Despite its popularity in both practice and research, the concept of "BPM still remains largely atheoretical." (Trkman, 2010, p. 125) Just recently, research has proposed, for instance, new conceptual frameworks (Smart, Maddern and Maull, 2009), theory-informed critical success factors (CSFs) (Trkman, 2010), and core elements of BPM (Rosemann and vom Brocke, 2010). Niehaves et al. (2011) and Ortbach et al. (2012) refer to DCT for defining BPM. They describe BPM as a capability that enables an organization to change its business processes for ensuring a fit with the market environment. They identify sensing, seizing, and transformation as the three BPM sub-capabilities that are relevant for the success of business process changes (Table 1). Trkman (2010) also uses DCT to identify CSFs for BPM.

Sub-capability	Description	Outcome
Sensing	Activities that help the organization identify the need to change business processes.	Impulses and needs to change business processes.
Seizing	Activities that help the organization decide how a business process is to be changed.	Concrete suggestions how a business process should be designed in the future.
Transformation	Activities that help the organization implement an agreed upon solution for changing its business process in the actual setting	Re-designed business process is implemented in the organization.

Table 1: BPM Sub-Capabilities (see Niehaves et al., 2011; Ortbach et al., 2012)

DCT extends the resource-based view (RBV) by suggesting a special kind of capability that allows organizations to adjust their resource configuration and, thereby, to sustain competitive advantage (Barreto, 2009; Teece, Pisano and Shuen, 1997). Dynamic capabilities do not directly generate output for the organization, but build, integrate, or reconfigure operational capabilities (Teece et al., 1997). DCT seems especially suitable to conceptualize BPM as BPM is often described similarly to the general concept of dynamic capabilities (Niehaves et al., 2011). Zairi (1997, p. 64) for instance, defines BPM as "a structured approach to analyze and continually improve fundamental activities […] of a company's operation." Similarly, specific dynamic capabilities have been mentioned in the literature which are very similar to the notion of BPM, including "restructuring" or "re-engineering" (Zollo and Winter, 2002).

Adopting this theoretical perspective, business processes represent operational capabilities that are shaped by the dynamic capability BPM (Ortbach et al., 2012). Both operational capabilities (i.e., business processes) and dynamic capabilities (i.e., BPM) make use of, transform, and produce assets. Assets are inputs or outputs of a process and they can be either tangible (e.g., a firm's plant and equipment, IT infrastructure) or intangible (e.g. patents, software) (Wade and Hulland, 2004). Enacting an organizational capability includes the ability to deploy assets in order to achieve some end results (Cresswell, Pardo and Hassan, 2007). On the zero-level, enterprise resource planning (ERP) systems and workflow management systems, for instance, can support the execution of business processes. On the dynamic capability level, tools for process monitoring, analysis and modeling can help to advance BPM capability. Some assets may even be useful at both levels, e.g., a workflow system or a BPM suite that supports process execution as well as process management at the same time. The other way round, the improvement of capabilities is also reflected by changes with regard to assets. This is because organizations typically choose to codify the experience made, lessons learned, and knowledge gained into new IT tools, manuals or blueprints (Eisenhardt and Martin, 2000; Zollo and Winter, 2002) (Figure 1).

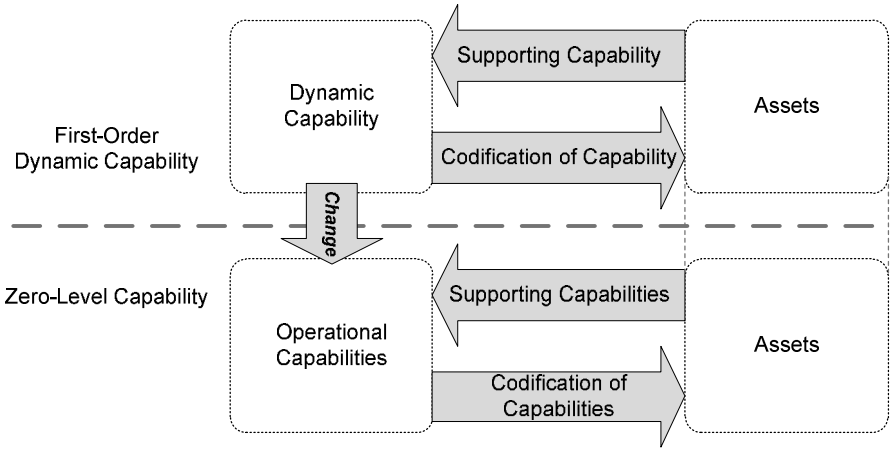

Figure 1. Relationships between Dynamic and Operational Capabilities, and Assets

Business Process Management in Inter-Organizational Networks

For a long time, BPM has been considered to deal with the linkages between internal activities and processes only, whereas the linkages between organizations were a separate matter of supply chain management or electronic business (McAdam and McCormack, 2001). Due to the growing importance of alliances and networks, end-to-end business processes increasingly need to be managed across multiple organizations. This is also acknowledged by current BPM research (Niehaves and Plattfaut, 2011).

Academic literature on boundary spanning has discussed the roles of people and objects in connecting different intra- and inter-organizational entities. On the one hand, people, so-called *boundary spanners*, can perform boundary spanning roles, e.g., by facilitating knowledge sharing (Levina and Vaast, 2005). On the other hand, *boundary objects* can support connections between different entities by serving as a common reference point for interaction and collaboration about a common interest. These objects can manifest in a broad range of artifacts that "are plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites" (Star and Griesemer 1989 p. 393). Such artifacts can be physical or conceptual (Carlile 2002; Gal et al. 2008), reside in the interfaces among organizations (Gal et al. 2008), and satisfy the informational requirements of all of them (Star and Griesemer 1989). According to Carlile (2002), four different types of boundary objects can be distinguished, including *repositories* (e.g., databases, libraries), *standardized forms and methods* (e.g., engineering change forms), *objects or models* (e.g., sketches, drawings, and parts), and *maps of boundaries* (e.g., Gantt charts, process maps). Such boundary objects do not necessarily have to be IT-based. Nevertheless, existing literature from the IS discipline provides many IT-based examples like, e.g., document archives and wikis (Levina, 2006), tools for source code management in software development projects (Ramesh and Dennis, 2002), or inter-organizational information systems (Reimers, Johnston and Klein, 2008; Wareham, 2003).

Referring back to the distinction between the two levels of operational and dynamic capability, boundary spanning in inter-organizational settings occurs at both levels. At the level of operational capabilities, it is necessary to coordinate the business processes of the different organizations within the network. As long as no dedicated information system is used to digitally connect the collaborating partners, employees serve as boundary spanners who communicate with each other face-to-face, via mail, phone, fax or email, and, thereby, transmit relevant information (e.g., orders, invoices, status information). IT-based boundary objects, however, provide opportunities to automate certain information flows, thereby extending and speeding up information sharing at lower costs. At the level of dynamic capability, network partners are required to negotiate how to connect their business processes and, accordingly, need to mutually agree on adequate (IT-based) boundary objects. In this regard, collaborative BPM refers to the joint design, change, and integration of business processes across organizational boundaries. It is assumed that this can be accomplished through practices and assets that facilitate negotiations, collaboration, and joint decision making (e.g., workshop discussions, collaborative process modeling, and computer-supported collaborative work). At each of these two levels, boundary spanning relies on both people and objects. On the one hand, boundary spanning requires individuals that coordinate their work steps or take part in workshops and meetings. On the other hand, technical assets are employed, e.g., joint databases, standardized electronic business documents, or software tools that enable geographically distributed group work or collaborative process modeling. Based on these considerations, Figure 2 presents a theoretical framework for collaborative BPM in networks. For reasons of simplicity the depicted network is limited to a dyad of two network partners.

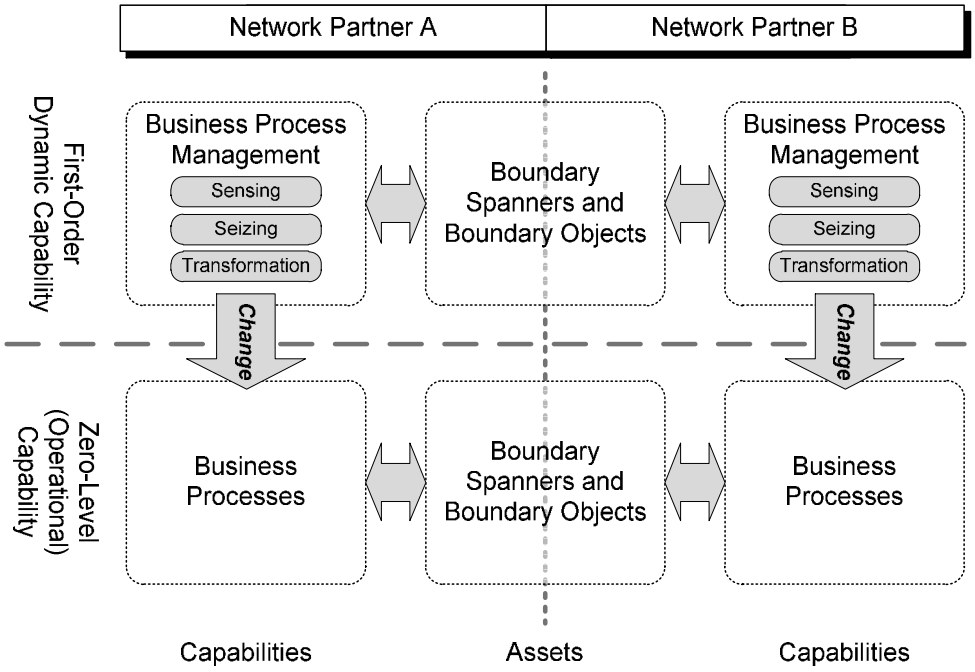

Figure 2. Theoretical Framing of BPM in Networks

RESEARCH DESIGN

Research Setting

The development towards a networked economy is particularly observable from manufacturing and service organizations that engage in collaborative partnerships to develop and deliver new customer-oriented offerings (Agarwal and Selen, 2009; Lusch, Vargo and Tanniru, 2010). They form networks in order to jointly provide product-service systems that are comprised of both tangible goods and service elements (Baines et al., 2007) "A product-service system (PSS) is an integrated combination of products and services." (Baines et al., 2007, p. 1543) PSSs enable manufacturing and service organizations to provide innovative and integrated solutions that could not be offered by any of the firms alone (Basole and Rouse, 2008; Dyer and Singh, 1998).

Three organizations participated in this study, all of which are engaged in inter-organizational networks that provide PSSs:

- BATHROOM is a small company that offers an innovative PSS for bathroom refurbishments in hospitals and student accommodations. BATHROOM formed a network together with manufacturers of wall panels, manufacturers of bathroom facilities, regional wholesalers, and local craftsmen and works closely together with a consultancy that takes care of finances and general administrative activities. For this study, the Senior Consultant and the IT Consultant – although they are employed at the consultancy – behaved and were treated like employees of BATHROOM.
- PAINT is a subsidiary of a larger chemical company that produces automotive refinish paint. The main customers are paintshops that repair cars. PAINT is engaged in a network with its sales organizations around the globe, independent dealers, and manufacturers of paint equipment (e.g., facilities for spraying and drying the coating). Together with these network partners, PAINT offers integrated solutions of paint, paint equipment, color formula identification services, and on-site trainings on the use of paint and equipment.
- RECYCLING is a recycling service provider that forms networks with manufacturers of electronic devices. RECYCLING's service portfolio includes the collection and disposal of electronic scrap as well as additional consulting services for manufacturers about how to organize the reverse flow of materials. RECYCLING has become one of the leading companies in this market in Germany. Further actors in RECYCLING's service networks are a German coordination authority, regional carriers, and disposal firms.

Data Collection and Analysis

For this study, 9 interviews were conducted with 12 representatives from the case organizations (i.e., in some of the interviews two or more interviewees were involved). The interviewees are key actors in their organization's BPM and/or in the development, selling, and delivery of PSSs (Table 2). The interviews lasted from 30 minutes to two hours. The semi-structured interview guideline (which can be retrieved from the author upon request) covered different aspects of the collaborative management of business processes in networks, including partner relationship management, joint design, enactment, and controlling of business processes, BPM strategy, and network information management.

The qualitative data was analyzed using the software tool NVivo 9. Boundary spanners and boundary objects on both the level of operational capability and dynamic capability were analyzed. Moreover, the data of all cases was coded by the author based on the categories that were provided by the three BPM sub-capabilities of sensing, seizing, and transformation.

Case Organization	Number of Interviews / Interviewees	Word Count of Interview Transcripts	Main Period of Data Collection	Positions of Interviewees
BATHROOM	2 / 3	18,500	11/2010	Founder, Senior Consultant, IT Consultant
PAINT	2 / 4	19,500	11/2010 – 12/2010	Marketing Manager, Controller, Product Manager, Customer Service Manager
RECYCLING	5 / 5	24,000	12/2010 – 02/2011	Consultant, Head of Consulting, Head of IT and Administration, IT Project Manager, Head of Marketing and Sales

Table 2: Overview of Collected Interview Data

RESULTS

The following sections present the results as provided by the analysis of the interviews. First, it is described how boundaries in networks are spanned at the process level, i.e., at the level of operational capabilities. Second, insights are provided how the three case organizations collaborate with their network partners on the BPM level, i.e., at the level of dynamic capabilities. Here, the three sub-capabilities of BPM sensing, seizing and transformation are addressed specifically.

Boundary Spanning at the Level of Operational Capabilities

The interviewees explained how they connect the business process within their inter-organizational networks with the help of boundary objects and boundary spanners. The IT Manager of RECYCLING, for instance, pointed at growing aspirations of their partners to develop common information systems with the aim to improve information sharing:

> *"Meanwhile, [they] are also very strongly interested to work on joint solutions because they benefit in the end as well. For example, with [one partner], we transmit invoice data, from the invoices we send them on paper, also as digital files into their SAP system. That way, they are able to import the data automatically without entering the data manually."* (RECYCLING, IT Manager)

On the one hand, networked organizations agree on standard formats for data exchange. This way, RECYCLING maintains digital connections to different kinds of partners like local carriers and disposal firms:

> *"That is, [this authority], assigns orders to [our partner]. They come in as PDF documents and our system takes this PDF document, imports it automatically and generates an order in the system. And, on the other hand, we will place an order at our disposal firms […] and they also automatically receive an interface file in XML format that they, in turn, can import into their systems."* (RECYCLING, IT Manager)

On the other hand, databases or repositories can be set up that are accessible by all partners. Typically, they reside at one partner, like at BATHROOM, where a web-based CRM system is used. There, sales information about potential customers and construction sites are stored in one place.

> *"It is a web-based CRM system, so in case the [partners] get an account they can access all the information, we even can have workflows between all those partners, which are then basically different users in the same system."* (BATHROOM, IT Consultant)

At PAINT; the Product Manager explained that sometimes databases are used to coordinate activities with partners. He indicates, however, that a very close integration of information systems across organizational boundaries is not common:

> *"In some cases we use specific databases to help other people to take on some things and to tell us if they are finished with some activities. But it is rather seldom."* (PAINT, Product Manager)

BATHROOM sees potentials for improvement in the phases of distributed pre-fabrication and on-site construction. Here, information is still shared via classic communication media, including email, phone, and fax:

> *"Today, we have the status quo, where we have to say that the information flows primarily run via email, the classic phone call, and, finally, fax, which is quite common in this area. We are very aware of the potential for optimization that is in here."* (BATHROOM, Senior Consultant)

Hence, all organizations that participated in this study employ some kind of IT-based boundary object – in addition to traditional ways of communication – to connect their business processes with those of their partners. They also indicated a strong tendency to expand the use of shared information systems.

Boundary Spanning at the Level of Dynamic Capabilities

As initiatives for inter-organizational BPM are concerned, the interviewees mostly referred to meetings and workshops in which the (re)design of processes and information flows is discussed. Those who take part in such workshops serve as boundary spanners. They need to find a common language for discussing which options for changing business processes and which connecting boundary objects are available and feasible. The following sub-sections illustrate how boundary spanning is accomplished with regard to the three sub-capabilities of BPM, i.e., sensing, seizing, and transformation.

Sensing

Sensing refers to the recognition of opportunities or needs for a new business process design or business process change. At RECYCLING, for instance, the consultants attempt to have regular meetings with their partners in order to identify potential process weaknesses. Sometimes, they consider adopting best practices from other networks:

> *" You definitely look for best practices, too. That is, you try to transfer one or another thing that really works well from one partner to another." (RECYCLING, Head of Consulting)*

At BATHROOM, impulses for change processes came from an analysis of information flows that was conducted by the IT Consultant. He analyzed documents, messages, and protocols of conversations with partners that were stored in BATHROOM's CRM system.

> *"I used this information to streamline the different procurement processes. […] When the on-site construction starts, all components have to be at site and you have to check the different purchase processes across all partners. […] When certain bathroom parts have to be produced, finished, delivered, and how they are delivered." (BATHROOM, IT Consultant)*

Changes to laws and regulations can also force network actors to implement new or redesign existing business processes. An example is the European Union WEEE (Waste Electrical and Electronic Equipment) directive which became effective in 2005:

> *"This form of collecting waste electronic equipment had to be developed completely anew. The complete take-back system had not existed before. There was no organization, there were no processes; and, therefore, we incorporated the wishes and requirements of our [partners]." (RECYCLING, Consultant)*

The discussion of impulses for process change within the analyzed networks mainly happen in face-to-face discussions. PAINT's Marketing Manager emphasized that sensing typically requires many meetings in which ideas for the new development or improvement of business processes are discussed.

Seizing

Seizing involves the identification and comparison of possible responses to the sensed impulses for business process change. According to RECYCLING's Consultant, the actual development of a new process design occurs in an iterative manner:

> *"Together with [the partner] we agree on the processes and the documentations. After several iteration loops, a process approval is provided by the [partner]." (RECYCLING, Consultant)*

At RECYCLING, processes are modeled using Microsoft Visio and the EPC (Event-driven Process Chain) notation. PAINT's Marketing Manager, in contrast, thinks that process models can become too complex to be understood and accepted by their partners:

> *"Processes are rather short so you can do it with PowerPoint. […] If it were more complex, I am sure, sales wouldn't buy it. […] They need easy solutions, which they can manage." (PAINT, Marketing Manager)*

At PAINT, they make use of RACI (responsible, accountable, consulted and informed) matrices and textual process descriptions:

> *"Whenever we have a partnership for delivering a solution, then we describe the steps and responsibilities and a RACI chart is normally assigned to the things plus the process description on how the partnership should be and where the people interact in the chain." (PAINT, Product Manager)*

The IT Consultant at BATHROOM reported that only a very abstract joint business process was designed when the network was initially established:

> *"At the time [BATHROOM] founded the cooperation […], they decided on a joint business process on a very abstract level. That's how small and medium companies draw their business processes. […] That's all what they have with regards to joint business processes." (BATHROOM, IT Consultant)*

Sometimes, new information systems are implemented to specifically support cross-organizational information flows. The IT Manager of RECYCLING mentioned the following example:

> *"It is about the integration of the [partner] in one's own processes, that is, one really wants to work together absolutely, on a mutual basis. In this particular case we also work on a solution by which we can provide an online portal where we can share data. This means that the [partner] provides data input. We do, too. And then, both parties can analyze the data." (RECYCLING, IT Manager)*

Generally, RECYCLING's IT Manager recommends to gather the final approval for a new process design from all relevant stakeholders:

> *"That is why one permanently monitors if it suits all parties. And, in the end, there is a complete appraisal before going life; so that everybody says: ok, that's how we imagined it, that's how it can start." (RECYCLING, IT Manager)*

The seizing activities appear to be generally run through in an iterative manner. The interviewees reported that possible solutions are developed, evaluated based on their economic effects, and then elaborated in further detail, e.g., as regards IT requirements. Then, adjustments may be needed until an agreement is achieved. The use of collaboration platforms or other tools that would support this iterative process were not observable from the interview data. Instead, a major part of seizing activities seems to happen within a single organization in isolation first before discussions in joint workshops follow. In some cases, process modeling techniques were used for this purpose (e.g., at RECYCLING), whereas, more often, comparatively simple means (e.g., at PAINT) were used for defining and communicating to-be processes.

Transformation

Transformation is realized through change management activities, which are necessary for implementing new or modified business processes. The aim is to embed new the business process designs, as resulting from seizing, into the organization. For this purpose, the Head of Consulting at RECYCLING recommends the timely distribution of documentation:

> *"What we frequently do is to provide documentation in advance; about the changed processes, the new to-be. It is necessary to inform all those who are involved in this particular process about the new to-be and to coordinate with them the point in time when the change will be effected." (RECYCLING, Head of Consulting)*

At BATHROOM, for example, it is required that key individuals (e.g., the founder of BATHROOM or experienced partners) train new network partners directly at the construction sites:

> *"I have been at the construction sites several times, and, often, if there is a new solution partner, i.e., a new company engaged into the network, [the founder of BATHROOM] has to drive to the construction site to do the knowledge transfer, to manage different employees on the new site." (BATHROOM, IT Consultant)*

Once new processes or partners have been embedded into the network, it seems desirable to implement a continuous review of process performance:

> *"And then, it will be controlled if the goals, which we have agreed upon for these processes, have been achieved; and if it is the right way of working and the right solution. And if not, adjustments will follow of course during a continuous improvement process." (RECYCLING, Consultant)*

From the interview data, it became obvious that transformation is not easily accomplished as it may require considerable efforts in persuading and training people. Generally, each partner mainly cares about his own sub-processes. Nevertheless, at BATHROOM new network partners are trained on the job and RECYCLING recommended joint reviews to institutionalize and continuously improve processes.

DISCUSSION

The presented theoretical framing proved helpful in analyzing collaborative BPM in exemplary networks. The interview data shows that networked organizations make use of boundary spanners and boundary objects to connect their operations and to collaborate in BPM initiatives.

At the level of operational capabilities, all case organizations employ some kind of IT-based boundary object. Indeed, this is little surprising. On the one hand, they agree on standard formats for data exchange, e.g., specified layouts of PDF documents or XML schemas at RECYCLING. According to Carlile's (2002) taxonomy of boundary objects, such agreed formats for data exchange fall into the category of *standardized forms and methods.* On the other hand, databases or repositories are set up that are accessible to all partners, like at BATHROOM, where a web-based CRM system is hosted that is also accessible to its network partners. Carlile (2002) uses the term *repository* for this type of boundary object which provides a common reference point of data across organizations. Such IT-based boundary objects represent technical assets which can be utilized by operational capabilities (see lower half of Figure 3).

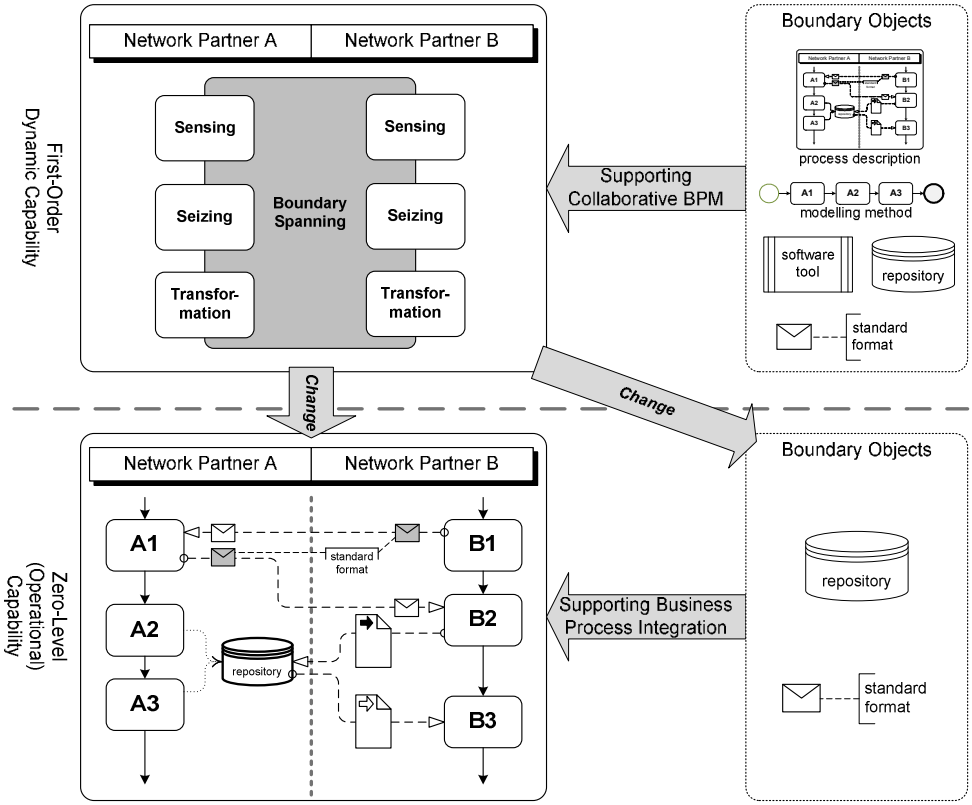

Figure 3. Boundary Objects in Collaborative Business Process Management

At the level of dynamic capabilities, IT-based boundary objects are also used. At PAINT, simple process diagrams and textual descriptions serve for modeling business processes and communicating process designs within the network. At RECYCLING, processes are modeled using Microsoft Visio and the EPC modeling notation and the models are made accessible to partners via an online portal. According to Carlile's (2002) typology, such process models basically represent *maps of boundaries* that depict the interfaces and dependencies that exist between the business processes of different organizations. However, more sophisticated IT-based boundary objects were not employed to support collaborative BPM and there still is a heavy reliance on face-to-face meetings for discussing process changes. *Repositories* and *standardized forms and methods* are hardly used at this level although this could be beneficial to the design, administration, and sharing of joint process descriptions. Only at RECYCLING, a *repository* in terms of an online portal with process descriptions was used. Web-based tools, however, which would allow for distributed and asynchronous process modeling, were not identified. Moreover, the case organizations hardly used accepted process modeling notations like, e.g., BPMN (Business Process Modeling Notation) or EPC which could serve as *standardized forms and methods* for network-wide BPM initiatives (see Figure 3 for the potential use of boundary objects this level).

CONCLUSION AND LIMITATIONS

The presented framework is conceived as a valuable contribution to both practice and research. As for practice, process managers who feel the need to evaluate their collaborative BPM capability can use this framework as a systematic blueprint. They can reflect if sufficient capabilities in the depicted areas (i.e., sensing, seizing, and transformation) and supporting boundary spanners and objects are in place. They can diagnose deficiencies and decide for improvement measures to advance their overall collaborative BPM capability. As for research, this framework contributes to the current academic efforts to put BPM on a more solid theoretical basis (see also Ortbach et al., 2012; Smart et al., 2009; Trkman, 2010). It provides a theoretical framing from which future studies can depart to further explore collaborative BPM.

Admittedly, the study is beset with certain limitations which should be addressed by future research. As for the presented theoretical framing, concepts from very different strands of research with potentially conflicting implications have been combined. First, collaborative BPM has been conceptualized as a dynamic capability that includes sensing, seizing and transformation activities. In this regard, further debate and empirical investigation are necessary to clarify whether the relatively new conceptualization of BPM as a dynamic capability proves valid and useful. Second, this dynamic capability is described here in a way that it includes the purposeful employment of boundary objects (e.g., information systems) and boundary spanners (people) at the interfaces to network partners in order to connect cross-boundary business processes. However, Levina and Vaast (2005) argue that it is impossible to predetermine whether a designated boundary object will actually support boundary spanning as this is dependent on the "situated practices of the agents who use them" (p. 340). This argumentation leads to the question whether boundary objects can be purposefully employed at all or if they are only designated as potentially valuable for boundary spanning by executives (Levina and Vaast, 2005). Moreover, research on boundary spanning has provided little guidance so far how organizations should proceed to identify or create boundary objects in practice. Due to these open issues, the framework is expected to be subject to refinements in the future. In addition, a comprehensive literature review of boundary spanning practices in the field of BPM, business process integration, supply chain management, and inter-organizational collaboration could help to conceptualize more fine grained elements that may detail and extend the presented framework.

Apart from the presented framework, the case study results call for design-oriented IS research in which new methods and tools will be developed that may serve as useful IT-based boundary objects for collaborative BPM efforts (e.g., in terms of innovative web-based tools for collaborative process modeling). Finally, also concerning the case study, the presented findings build on a limited number of interviews at each site only. Additional interviews and observations are desirable to enrich each setting with more illustrative accounts of collaborative BPM practice. Likewise, the sample could be extended to inter-organizational settings apart from PSS business models.

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