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THE FUTURE OF BUSINESS PROCESS MANAGEMENT IN THE FUTURE OF WORK

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Abstract

Business process management (BPM) is a corporate capability that strives for efficient and effective work. As a matter of fact, work is rapidly changing due to technological, economic, and demographic developments. New digital affordances, work attitudes, and collaboration models are revolutionizing how work is performed. These changes are referred to as the future of work. Despite the obvious connection between the future of work and BPM, neither current initiatives on the future of BPM nor existing BPM capability frameworks account for the characteristics of the future of work. Hence, there is a need for evolving BPM as a corporate capability in light of the future of work. As a first step to triggering a community-wide discussion, we compiled propositions that capture constitutive characteristics of the future of work. We then let a panel of BPM experts map these propositions to the six factors of Rosemann and vom Brocke's BPM capability framework, which captures how BPM is conceptualized today. On this foundation, we discussed how BPM should evolve in light of the future of work and distilled overarching topics which we think will reshape BPM as a corporate capability.

Keywords: Business Process Management, Capability Development, Future of Work.

1 Introduction

Process orientation has evolved into a widely used paradigm of organizational design and proved to be a valuable source of corporate performance (Kohlbacher and Reijers, 2013; Skrinjar et al., 2008). As a result, business process management (BPM) receives constant attention from industry and academia (Dumas et al., 2013; Harmon and Wolf, 2014). In the last years, the BPM community has proposed mature approaches for the design, analysis, enactment, and improvement of business processes (van der Aalst, 2013). Currently, the BPM community focuses ever more on the organizational impact of BPM as well as on the development of BPM as a corporate capability (Pöppelbuß et al., 2015; Trkman, 2010; van Looy et al., 2014). Developing BPM is thus regarded as a prerequisite for successful processes, i.e., for efficient and effective work (Rosemann and vom Brocke, 2015; Harmon, 2014).

The nature of work is changing rapidly. Contemporary technological, demographic, and economic developments are revolutionizing how work is performed. New digital affordances, such as virtual collaboration tools as well as mobile applications and devices, enable innovative collaboration models and emancipate work from context factors such as time and location (Allen, 2015; Brynjolfsson and McAfee, 2014; McAfee, 2009). A connected work environment allows for dynamically assembling workers into project teams that compete in real-time for high-value tasks all over the world (Ardi, 2014). The emerging digital mindset also propagates customization and flexibility as core values, while challenging work

practices that rely on predictability, uniformity, and consistency (Notter, 2015). The term future of work is widely used to refer to a new world of work brought about by technological trends in global connectivity, smart machines, and new media as well as changing social, political, and economic factors. While, due to its broad scope, the future of work impacts various disciplines, it directly influences organizational strategy and design (Malone, 2004). Thus, there is an obvious connection between the future of work and BPM, which in turn is "the art and science of overseeing how work is performed" (Dumas et al., 2013, p. 1). In the recent past, valuable initiatives started to reason about the future of BPM research and practice (Recker, 2014; Rosemann, 2014; vom Brocke et al., 2011; vom Brocke et al., 2014). These initiatives, however, do not explore the connection between the future of work and BPM. Similarly, existing capability frameworks, which capture how BPM as a corporate capability is or should be conceptualized, do not account for the characteristics of the future of work (Rosemann and vom Brocke, 2015; van Looy et al., 2014). Recker (2014) criticizes that many BPM capability areas "have too readily been accepted and taken for granted" (p. 12). Against this background, there is a need for evolving how BPM is conceptualized today in light of the future of work. Thus, we investigate the following research question: *How does BPM as a corporate capability need to evolve in light of the future of work?*

We approach this research question using a three-phase research method. To understand what the future of work actually is about, we conducted a structured literature review and compiled propositions that capture constitutive features of the future of work. To examine in a structured manner how the future of work impacts BPM, we used Rosemann and vom Brocke's (2015) seminal BPM capability framework as a reference point and asked BPM experts to map the propositions related to the future of work to the six factors of BPM of Rosemann and vom Brocke's framework (strategic alignment, governance, methods, IT, people, and culture). Using Rosemann and vom Brocke's (2015) framework is sensible as it has been extensively referenced by fellow BPM researchers and captures how BPM is conceptualized today. Based on the mapping of propositions to BPM factors, we discussed how the capability areas of the BPM framework should evolve in light of the future of work. Thereby, we believe that the related changes are more of an evolutionary than a revolutionary nature. In our study, we take an operational perspective on work, which we define as "the application of human, informational, physical, and other resources to produce products/services" (Alter, 2013, p. 75).

Since the connection between the future of work and BPM is complex, this study can only be an initial attempt to explore relevant changes in the way BPM is conceptualized. We are aware that our findings may suffer from subjective influences, as we did not involve the entire BPM community so far. Nevertheless, with this study we aim at complementing existing initiatives on the future of BPM, triggering a discussion in the BPM community, and providing initial insights into implications of the future of work.

The study is organized as follows: In section 2, we provide theoretical background on BPM in general and on BPM capability development in particular. In section 3, we elaborate on the research method. In section 4, we present the results of each research phase. In section 5, we point to key limitations of our work and directions for future research.

2 Theoretical Background

BPM comprises "the skills and routines necessary to successfully apply measures of both incremental and radical change with the goal to improve the effectiveness and efficiency of business processes" (Pöppelbuß et al., 2015, p. 3). BPM is closely related to capability development, a field that builds on the resource-based view and on dynamic capability theory (Niehaves et al., 2014). Conceptualizing and investigating BPM from a capability perspective is very popular in BPM research (Forstner et al., 2013; Niehaves et al., 2014; Rosemann and vom Brocke, 2015; Trkman, 2010; van Looy et al., 2014). As its practical suitability has also been empirically validated (Plattfaut, 2014), we adopted the capability perspective when exploring how BPM needs to evolve in light of the future of work.

According to the resource-based view, capabilities refer to the ability to perform a set of tasks for achieving a particular result (Helfat and Peteraf, 2003). From a dynamic capability theory perspective, capa-

bilities split into operational and dynamic capabilities (Pavlou and El Sawy, 2011). Operational capabilities refer to an organization's basic functioning, whereas dynamic capabilities help to integrate, build, and reconfigure operational capabilities to increase their fit with the environment as well as their effectiveness and efficiency (Kim et al., 2011; Winter, 2003). In the literature, processes and their execution are equated with operational capabilities, whereas BPM is treated as a specific dynamic capability (Forstner et al., 2013; Pöppelbuß et al., 2015).

Research on BPM as a corporate capability follows three streams. The first stream focuses on the structuration of BPM and on developing related capability frameworks (Jurisch et al., 2014; Rosemann and vom Brocke, 2015; van Looy et al., 2014). The common approach is to group similar capabilities into capability areas and eventually into factors (Rosemann and vom Brocke, 2015). Jurisch et al. (2014), for instance, derive process management as well as IT and change management capabilities needed for business process change. Van Looy et al. (2014) present six capability areas with 17 sub-areas for business process maturity. The most prominent and holistic BPM capability framework is that by Rosemann and vom Brocke (2015). As we rely on this capability framework as a reference point in our research, we provide more details below. The second research stream is concerned with describing how organizations typically develop their BPM capability and how different types of BPM capability development can be explained (Niehaves et al., 2014; Pöppelbuß et al., 2015). The third research stream related to BPM capability development takes a prescriptive perspective, providing methods and recommendations on how to develop BPM in light of different organizational contexts (Darmani and Hanafizadeh, 2013; Lehnert et al., 2014). In this context, maturity models were long-time seen as the most appropriate tool for capability development (Forstner et al., 2013; Röglinger et al., 2012). However, as they have been criticized for ignoring path dependencies and for propagating a one-size-fits-all approach, they significantly lost popularity in BPM research over the last years (Lehnert et al., 2014; Niehaves et al., 2014).

Strategic Alignment	**Governance**	**Methods**	**Information Technology**	**People**	**Culture**	**Factors**
Process Improvement Planning	Process Management Decision Making	Process Design & Modelling	Process Design & Modelling	Process Skills & Expertise	Responsiveness to Process Change	**Capability Areas**
Strategy & Process Capability Linkage	Process Roles and Responsibilities	Process Implementation & Execution	Process Implementation & Execution	Process Management Knowledge	Process Values & Beliefs	
Enterprise Process Architecture	Process Metrics & Performance Linkage	Process Monitoring & Control	Process Monitoring & Control	Process Education	Process Attitudes & Behaviors	
Process Measures	Process Related Standards	Process Improvement & Innovation	Process Improvement & Innovation	Process Collaboration	Leadership Attention to Process	
Process Customers & Stakeholders	Process Management Compliance	Process Program & Project Management	Process Program & Project Management	Process Management Leaders	Process Management Social Networks	

Table 1. The BPM Capability Framework by Rosemann and vom Brocke (2015)

In order to examine in a structured manner how the future of work impacts BPM, we rely on Rosemann and vom Brocke's (2015) BPM capability framework (Table 1). We use this BPM capability framework as a reference point as it captures well how BPM is conceptualized today. Rosemann and vom Brocke's (2015) capability framework is based on a rigorous Delphi study and takes a holistic perspective, covering a broad spectrum of topics associated with BPM research and practice. As the framework has been

referenced by many fellow BPM researchers, it can not only be seen as a comprehensive, but also as the most prominent BPM capability framework to date. Rosemann and vom Brocke's framework comprises six factors critical to BPM, i.e., strategic alignment, governance, methods, IT, people, and culture. Each factor, in turn, includes five capability areas. Strategic alignment is concerned with the synchronization between processes and an organization's strategic goals. Governance investigates the roles and responsibilities as well as decision-making processes related to BPM. Methods comprises the "set of tools and techniques that support and enable activities along the process lifecycle and within enterprise-wide BPM initiatives" (Rosemann and vom Brocke, 2015, p. 111). IT emphasizes the IT support across the BPM lifecycle. People refers to the role of employees in processes, whereas culture reflects "collective values and beliefs in regards to the process-oriented organization" (Rosemann and vom Brocke, 2015, p. 118). Table 1 provides an overview of the individual factors and capability areas in the capability framework.

3 Research Method

In order to examine how BPM as a corporate capability needs to evolve in light of the future of work, we follow a three-phase research method. In the first phase, we used a structured literature review to compile propositions from the existing body of knowledge that capture constitutive features of the future of work. In the second phase, a panel of BPM experts mapped the resulting propositions to the six factors of Rosemann and vom Brocke's (2015) BPM capability framework. In the third phase, we discussed the factors and capability areas included in the BPM capability framework according to the mapping results.

In the first phase, two authors performed separate structured literature reviews using the "future of work" as full-text search term in SpringerLink (http://link.springer.com), AISeL (http://aisel.aisnet.org), and ScienceDirect (http://www.sciencedirect.com). The goal of this phase was to identify constitutive characteristics of the future of work as contained in the existing body of knowledge. When conducting the literature review, both authors adhered to the guidelines established by vom Brocke et al. (2015) as well as Webster and Watson (2002). Content-wise, the literature review was restricted to work from an operational viewpoint, which complies with the focus of BPM (van der Aalst, 2013). Consequently, publications that examine interfaces between the future of work with areas such as labor law or remuneration policies were excluded. Due to the very sporadic occurrence of the term "future of work" in sources published before the year 2000, the literature review was further restricted to the time period between 2000 and 2015. To get a holistic picture of the future of work, we also included four reports from leading consulting and government agencies as well as three seminal books, i.e., "The Future of Work" (Malone, 2004), "Enterprise 2.0" (McAfee, 2009), and "The Second Machine Age" (Brynjolfsson and McAfee, 2014). Each author checked all identified sources for quotations with a definitional character, collected these quotations, and aggregated these quotations into initial propositions each of which covers a constitutive feature of the future of work. We consolidated the initial propositions in five workshops within the entire author team to eliminate redundancies and achieve a consistent level of abstraction. We also checked that each quotation was covered by one or more propositions and that each proposition was underpinned by several quotations. The intention of starting with the extraction of quotations was to create a comprehensive and detailed list of features regarding the future of work. The purpose of aggregating quotations into propositions was to compile a more manageable, yet still comprehensive picture of the future of work that can be used in the following research phases. In sum, the literature review yielded 23 propositions derived from 526 quotations and 37 sources. All sources are included in the references section marked with an asterisk (*). As final step of the first research phase, we validated the propositions with two external experts (i.e., professors doing research on the future of work with more than 10 years of experience) for completeness and consistency.

In the second phase, we conducted a consensus-based, multi-round mapping process, in which we established a connection between the propositions related to the future of work and the factors of Rosemann and vom Brocke's (2015) BPM capability framework (Fink et al., 1984). This second phase served as an intermediate step to reduce the complexity of our approach and to make our conclusions in the last research phase more transparent. Considering all propositions for each factor would have required to

analyze 138 (23x6) combinations, making it impossible to trace the most significant effects. To conduct the mapping of propositions to factors, we asked a panel of ten BPM experts to assign each proposition to those BPM factors that they deem will be affected most strongly by the respective proposition. We decided against letting the BPM experts map the propositions to the 30 individual capability areas for the same reason as mentioned above, as the task complexity would have been too high to solve the mapping in a "timely and economical way" (Fink et al., 1984, p. 981). We had to deal with very specific and rather broad propositions. Some propositions are such specific that it was obvious from the beginning that they do not affect all factors. Moreover, BPM and the future of work have evolved independently such that there is no intuitive or established mapping. Overall, we granted the BPM experts the degree of freedom to choose zero, one, or two BPM factors per proposition and also asked them to validate the propositions regarding understandability. We recruited BPM researchers who had several years of experience in the field and were familiar with Rosemann and vom Brocke's (2015) capability framework. Four of the experts had an IT and the others – a business background. Furthermore, half of the experts had considerable experience in BPM-related industry projects. We measured the consensus among the experts using an adapted version of Cohen's Kappa (Kraemer, 1980). Using an adapted version was necessary as the experts were allowed to assign each proposition to zero, one, or two factors of the capability framework. According to the guidelines on consensus methods, we set a satisfactory consensus level at a Kappa value of 0.61 (Fink et al., 1984), which equals substantial agreement on the Landis and Koch (1977) scale. In the first mapping round, in which the experts worked independently of one another, we achieved a Kappa of 0.43. The second mapping round, in which the experts could access the anonymized and aggregated mapping results of the initial round, yielded a Kappa of 0.63, satisfying our predefined consensus requirement. Thus, the mapping procedure ended after the second round. Thus, the result of the second research phase is a 23x6 matrix (23 propositions, 6 factors), containing the cumulated votes of the second mapping round. As input for the third research phase, we used those mapping results where a proposition received five or more votes regarding a distinct BPM factor, i.e., a consideration by at least 50% of the BPM experts. This selection rule resulted in a manageable number of propositions per BPM factor.

In the third phase, we discussed the capability areas of Rosemann and vom Brocke's (2015) BPM capability framework according to the mapping results. To do so, we again conducted a series of workshops within the author team. In order to structure the discussion and to mitigate subjective influences, each author first considered the influence of each proposition, which has been selected for a distinct BPM factor, on all related capability areas independently. We then consolidated the individual results.

4 Results

4.1 Compiling constitutive features of the future of work

As the result of the first research phase, Table 2 shows 23 propositions that capture constitutive characteristics of the future of work as contained in the existing body of knowledge. Table 2 further indicates how many sources from the structured literature review support each proposition. Finally, Table 2 highlights the number of votes that each proposition received from the BPM experts regarding the factors of Rosemann and vom Brocke's (2015) BPM capability framework in the second research phase. The factors are named by their initial letter, i.e., S for strategic alignment, G for governance, M for methods, I for information technology, P for people, and C for culture.

ID	Proposition	Supp.	BPM Factors					
			S	G	M	I	P	C
P01	Ethical and work values as well as reputation will play an important role.	11	2	1	0	0	4	**9**
P02	Technology will complement human abilities.	10	1	0	0	**10**	**5**	2
P03	Work assignments and routines will change constantly.	11	0	**8**	**8**	0	1	0
P04	Work will be carried out independent of time and place.	17	0	0	0	**8**	0	**9**
P05	Work will require higher cognitive and creative capabilities.	15	0	0	0	0	**10**	0
P06	Workers will be highly specialized.	8	0	0	1	0	**10**	0
P07	Workers will be required to learn constantly on the job.	11	0	0	0	0	**10**	2
P08	Workers will require entrepreneurial thinking.	3	0	0	0	0	**9**	**6**
P09	Teams will be assembled and changed dynamically.	6	0	**8**	1	0	2	3
P10	Technology will be used to automate tasks.	11	1	0	2	**10**	0	0
P11	Work will be communication- as well as knowledge-intensive.	26	0	0	2	1	**9**	0
P12	Work will be conducted predominantly in projects.	7	0	**7**	**8**	0	0	3
P13	Workers will be free agents.	15	0	0	0	0	**8**	**6**
P14	Workers will be highly connected in communities.	16	0	0	0	1	**8**	**7**
P15	Collective intelligence will be important in decision-making.	6	0	**5**	1	0	4	**8**
P16	Decision-making will be decentralized.	10	0	**9**	1	0	0	4
P17	Finding and cultivating talents will be a key challenge.	4	**8**	1	0	0	3	**6**
P18	Information will be readily available independent of time and place.	6	0	0	1	**10**	0	1
P19	Low-skill, out-of-competence work will be outsourced.	7	**7**	**10**	0	0	0	1
P20	Market principles will be applied within organizations.	7	**10**	4	0	0	0	3
P21	Organizational hierarchies will be loose and flat.	17	0	**7**	0	0	0	**9**
P22	Organizations will exhibit a core-periphery structure.	4	**8**	**8**	0	0	0	2
P23	Technology will support all kinds of interactions.	5	1	0	2	**9**	0	1

Table 2. Propositions capturing the future of work and their mapping to BPM factors

It can be seen that the propositions vary regarding the extent to which they have already been adopted in current work practices. While the automation of tasks (P10), for instance, is already in full swing and cannot be considered as innovative or disruptive anymore, establishing market principles in organizations (P20) has by far not become a widespread practice yet. Therefore, some propositions refer to well-adopted trends, whereas others are in an early stage of development. This, however, does not imply that well-adopted propositions will not influence the way BPM should be conceptualized in light of the future of work. The automation of tasks (P10), for example, has been and still is central to BPM research and practice. Nevertheless, it drives many of today's developments related to digitalization in general and the Internet of Things in particular (Moore, 2015). In order not to bias the picture of the future of work as contained in the existing body of knowledge, we deliberately included well-adopted propositions in our analysis as well.

The propositions also differ in the number of supporting sources. We partly attribute this finding to the propositions' different level of adoption in current work practices, as pointed out in the previous paragraph. However, as can be seen, well-adopted propositions need not necessarily be more present in the literature on the future of work. There is a complex connection between a propositions' level of adoption and the number of supporting sources. The second idea that may play a role in the different number of supporting sources is that some propositions may be viewed as more central to the future of work than others. As an example, entrepreneurial thinking (P08) is a very broad proposition that affects operational work only indirectly. The independence of context factors like time and place (P04), in contrast, directly influences how operational work is performed. Analogous to the extent with which propositions have already been adopted in current work practices, we decided not to base the decision whether to include a proposition on its support to provide multiple viewpoints on the future of work.

4.2 Mapping the propositions to BPM factors

As already stated, columns S to C from Table 2 contain the number of votes the individual propositions received from the panel of BPM experts in the second research phase. More precisely, these columns show the total number of votes that the propositions received in the second mapping round, in which we achieved substantial consensus according to the applied Kappa coefficient. The cells highlighted in grey indicate the mapping results we selected as input for the third research phase as they received votes from at least 50% of the involved experts. Table 3 summarizes the numbers and concrete subsets of propositions mapped to the factors of Rosemann and vom Brocke's (2015) BPM capability framework.

The varying number of propositions per BPM factor suggests that the future of work will not influence all facets of BPM with equal strength. In particular, the factors methods, strategic alignment, and IT feature a rather low number of selected propositions. This finding is not surprising as methods and IT have been and still are at the core of BPM research and practice (Rosemann, 2014; van der Aalst, 2013). Similarly, strategic alignment has recently caught up, receiving ever more attention (Buhl et al., 2011; Rosemann, 2014; vom Brocke et al., 2014). In contrast, the soft factors people and culture, which have not yet been the focal points of BPM research (Schmiedel et al., 2014), consequently received a high number of propositions. Therefore, the BPM factors people and culture will be strongly influenced by the future of work, yielding a new balance between the hard and the soft factors of BPM. Most surprisingly, the factor governance, which has been extensively researched and is a core topic of BPM practice (Doebeli et al., 2011), received as many propositions as culture and people. One reason may be that the future of work propagates customization and flexibility as core value, while challenging current practices that rely on predictability, uniformity, and consistency, a development that will disrupt how operational work needs to be governed (Notter, 2015). We provide a more detailed rationale in section 4.3.

BPM Factor	Number of selected propositions	Selected propositions
Strategic Alignment	4	P17, P19, P20, P22
Governance	8	P03, P09, P12, P15, P16, P19, P21, P22
Methods	2	P03, P12
Information technology	5	P02, P04, P10, P18, P23
People	8	P02, P05, P06, P07, P08, P11, P13, P14
Culture	8	P01, P04, P08, P13, P14, P15, P17, P21

Table 3. Selected propositions per BPM factor

4.3 Rethinking BPM as a corporate capability

Based on the intermediate results shown in Tables 2 and 3, we now explore how BPM as a corporate capability needs to evolve in light of the future of work. To do so, we present our view on the changes within the BPM factors (i.e., strategic alignment, governance, methods, information technology, people and culture) and capability areas guided by the propositions selected in the second research phase. For each factor, we provide a general introduction before discussing each capability area. In Table 4, which is located at the end of this section, we summarize overarching capability-oriented topics which we think will shape BPM in the future of work across all factors of the BPM capability framework.

4.3.1 Strategic alignment

In Rosemann and vom Brocke's (2015) capability framework, strategic alignment refers to the synchronization between processes and organizational goals. Overall, a much more dynamic organizational periphery (P22) as well as increased outsourcing (P19) will lead to complex and rapidly changing organizational setups. It will be challenging to retain an overview of cross-organizational processes and to maintain their strategic fit. Moreover, it will be necessary to seamlessly integrate external partners rapidly and to ensure process continuity. Finally, the growing need for cultivating talents (P17) will require leveraging human capabilities to match organizational goals.

Process improvement planning will be more difficult due to the variety and heterogeneity of actors (P22) involved. Thus, it will need to be flexible enough to account for different workers at the periphery (P22) as well as for external partners (P19). In addition, the introduction of market principles (P20) has the potential to offer individual workers, teams, and departments appropriate incentives to improve their operations as well as to prioritize process improvement opportunities.

Regarding *strategy and process capability linkage*, the need for cultivating talents (P17) requires an increased effort when matching human capabilities to strategic goals. The opposite will be true, too, i.e., strategic goals must be aligned with the workers' capabilities. The increasing complexity of the organizational ecosystem (P22) will further complicate maintaining the strategic fit of all processes. Moreover, novel performance indicators that result from the use of market principles (P20) will have to be used to measure the synchronization of processes and strategic goals.

Enterprise process architecture, which deals with an organization's process landscape, will need to extend its scope to cover value networks and ecosystems with fast-changing actors (P19, P22). Since organizational boundaries will continuously blur, enterprise process architectures must ensure the integration of business processes across value networks, while maintaining an end-to-end perspective.

Process measures will benefit from market principles (P20) because process outcomes will be exposed to market conditions. Therefore, there will be fewer opportunities for inefficiencies to remain unnoticed.

Maintaining an overarching process performance measurement warehouse will allow for the cross-organizational navigation through real-time process performance metrics.

Regarding *process customers and stakeholders*, establishing market principles (P20) will cause organizations to be more attentive to external and internal customers. Coupled with an increased attention on managing the organization's talent pool (P17), this development will require to leverage workers' capabilities more efficiently to satisfy customer needs. Stronger outsourcing (P19) combined with a more volatile organizational periphery (P22) will pose a challenge on coordinating all involved stakeholders.

4.3.2 Governance

BPM governance is "dedicated to appropriate and transparent accountability in terms of roles and responsibilities" (Rosemann and vom Brocke, 2015, p. 114). It also regulates decision-making and reward processes. Since work practices will change constantly (P03) and shift more towards projects (P12), we anticipate process and project management governance mechanisms to merge. Just like the fusion of development and operations (DevOps) is an ever more employed paradigm in software development, the fusion of processes and projects can help organizations deal with the complexity and volatility of future work environments (Hüttermann, 2012). Variation in teams (P09) and work assignments (P03) also requires shifting management attention from single processes to process portfolios, in which synergies can be leveraged and dependencies among processes can be managed (Lehnert et al., 2015).

As for *process management decision-making*, the ability to quickly reconfigure processes will be crucial as work assignments and routines will change constantly (P03). Retaining an overview as well as ensuring consistency will be challenges in case of increasingly decentralized decisions (P16), the loss of control over outsourced work (P19), and flat hierarchies (P21). Another implication of decentralized decision-making (P16) is that processes will depend even more on the workers' capabilities.

Process roles and responsibilities will have to be redefined as the share of project work increases (P12) and the boundary between process and project management blurs. Existing roles will merge with roles employed in project management. Further, novel roles such as process portfolio managers and process team capability managers will emerge in order to ensure the matching of flexible process requirements and workers' capabilities for compiling adequate cross-functional teams.

Clear accountabilities for collecting and evaluating *process metrics and performance linkage* will be required such that it can be carried out fast and reliably in a value network (P22).

Process-related standards will be more difficult to enforce due to the project character of work (P12) coupled with the increased involvement of external partners and a more widespread organizational periphery (P19, P21, P22). Therefore, process-related standards will need to be complemented by service-level agreements and project-related norms.

We do not see significant changes in the capability area *process management compliance*.

4.3.3 Methods

BPM methods comprise the range of tools and techniques that support business processes throughout their lifecycle (Rosemann and vom Brocke, 2015). As pointed out with respect to the factor governance, the emerging variety of work patterns (P03), ranging from knowledge-intensive and creative to routine, will cause the boundary between processes and projects blur. The use and development of hybrid methods at the interface of process and project management will be required to support such work patterns, just as DevOps combines tools from software development and operations to streamline software delivery procedures (Hüttermann, 2012). As a result, the number of processes, for which traditional imperative process models can be designed, will decline.

Process design and modelling will be affected by the increasing project character of work (P12) as well as by rapidly changing work assignments (P03). Routine processes are increasingly giving way to unstructured, knowledge-intensive work (Herrmann and Kurz, 2011). Process design methods, thus, need to be further developed to adequately support such work patterns. As an example, declarative modelling

has already been employed by practitioners in conjunction with traditional methods (Reijers et al., 2013). Another example is the application of adaptive case management approaches in knowledge-intensive processes (Herrmann and Kurz, 2011). The speed of identifying suitable process models or fragments as well as creating new models will be crucial and will demand innovative approaches to storing, reusing, composing, and configuring process models (La Rosa et al., 2011).

In the capability area *process implementation and execution*, process definition and go live will need to be much more agile to cope with continuously changing requirements at run time (P03). Similarly, *process monitoring and control* methods as well as performance measures will have to be broadly applicable as process outcomes will vary with constantly changing work assignments and routines (P03).

Due to shorter process life-cycles, *process improvement and innovation* will entail fewer opportunities for operational improvements such as refining process reliability. Instead, process exploration, i.e., the effective and efficient capitalization on emerging process and technical opportunities (Rosemann, 2014), will take center stage.

In our view, the capability area *process program and project management* will not experience significant transformations in light of the future of work.

4.3.4 Information technology

Information technology (IT) encompasses the "software, hardware, and information systems that enable and support process activities" (Rosemann and vom Brocke, 2015, p. 116). IT will be instrumental in disentangling work from context factors such as time and place (P04). However, its domain will spread beyond the sole automation of routine tasks (P10) and management of workflows. On the one hand, IT will acquire its own agency, which allows smart connected things to autonomously interact with process workers at eye level (P23) (Kees et al., 2015; Porter and Heppelmann, 2015). On the other hand, IT will support process workers in creative and knowledge-intensive processes (P02) by managing and optimizing the information flow (P18) as well as by capitalizing on process data through advanced analytics.

Regarding *process design and modelling*, IT will be capable of autonomously generating various types of process models (P02, P10), based on the information flow among process participants and requirements for individual tasks.

As for *process implementation and execution*, smart systems as well as networks thereof will take over process roles similar to those of process workers. The interplay of IT, smart things, and humans (P02, P23) will lead to new forms of interaction in terms of cyber-physical/cyber-human systems (Gimpel and Röglinger, 2015). Further, cognitive assistants will assist workers by organizing and prioritizing information, resource allocation, and taking task control decisions (Lewis, 2014).

Process monitoring and control will face the challenge of dealing with decentralized and loosely coupled human as well as technical activities that have to be coordinated. To cope with that challenge, IT will have to enable simultaneous monitoring and control at runtime. Moreover, smart IT that "understands" the semantics and purpose of interactions (P23) will provide more contextual information about the state of a given process.

Process improvement and innovation will be enhanced by IT's ability to extract the meaning and predict the behavior of processes. Digital technologies such as recommender systems for process improvement and predictive analytics solutions will be able to automatically spot improvement opportunities as well as compile and suggest respective process fragments, advancing the explorative character of process improvement (Rosemann, 2014).

Just like in the factor methods, we do not anticipate considerable transformations in the capability area *process program and project management* in light of the future of work.

4.3.5 People

The factor people refers to the "individuals and groups who continually enhance and apply their process and process management skills and knowledge to improve business performance" (Rosemann and vom Brocke, 2015, p. 117). Increasing demands on the workers' creativity (P05), the ability to learn continuously (P07), and the ability to capitalize on existing knowledge (P11) will increase the importance of recruiting procedures. Managing the workers' capabilities will ever more make the difference in process results, given the dynamic and unstructured nature of work. Fostering entrepreneurial thinking (P08) as well as the workers' digital skillset and mindset will be crucial for acting upon improvement opportunities. As workers will be highly specialized (P06), organizations will need to pay increased attention to retaining people who can cope with knowledge heterogeneity and act as boundary-spanners (Fleming and Waguespack, 2007).

The capability area *process skills and expertise* will be affected by workers who, as free agents, will not identify themselves with a single organization (P13) and by the rising specialization of the workforce (P06). Leveraging knowledge communities will be central to keeping workers' skills up-to-date given that workers will be increasingly connected (P14) and required to learn constantly on the job (P07).

Process education will put an emphasis on soft skills since work will be communication-intensive (P11) and increasingly driven by collaboration. Continued specialization (P06) increases the need for boundary-spanners with knowledge at the interfaces of different disciplines and communication skills. However, process education will come to its limits when dealing with tasks that require higher cognitive and creative capabilities (P05), which are inherently difficult to train.

Process collaboration will take on various forms as new digital affordances such as smart objects, intelligent systems, and real-time analytics become parts of processes. A connected workforce (P14) with a digital mindset and affinity to technology will quickly utilize the opportunities of digital affordances. Emerging collaboration models will need to effectively support both ad-hoc and unstructured processes due to the decreasing fraction of routine work (P11). Furthermore, workers will be expected to quickly adapt to new process teams and unfamiliar environments (P07).

Process management leaders will be free agents themselves (P13), not necessarily affiliated with a particular organization. Still, they will have to find ways to effectively leverage the intelligence, creativity, and entrepreneurial spirit of workers from multiple organizations and to motivate these workers to perform tasks that demand higher-order skills (P05). One specific challenge for process management leaders will be to create a common understanding of work in teams of free agents (P06, P13). As outlined, bridging different knowledge areas will require the active involvement of boundary-spanners.

In light of future of work, we do anticipate severe changes in the capability area *process management knowledge*, which refers to specific BPM expertise only.

4.3.6 Culture

The factor culture comprises process-related values, beliefs, and behavior workers comply with in organizational settings (Rosemann and vom Brocke, 2015). While this factor mainly focuses on attitudes to process improvement, commitment to processes, and their role in organizations, we expect its meaning to broaden in the future. Since work will be independent of context factors (P04) and increasingly dynamic, culture will need to embrace agility as a core value to quickly adapt to new opportunities and react upon changes in the outside world. This observation is consistent with the CERT value framework, which promotes responsiveness to process output recipients and continuous orientation towards improvement and innovation (Schmiedel et al., 2014). As ideas, work practices, and beliefs spread across traditional structures, organizations need to become more open to avoid a not-invented-here-mentality (Piller and Antons, 2015). The importance of an open culture has already been highlighted in the context of open innovation (Herzog and Leker, 2010), but needs to be interpreted more broadly. Moreover, a

strongly pronounced human-centered approach is required since human capabilities will largely determine process outcomes – people will be involved in both decentralized and collective decision-making (P15) and will be expected to act as entrepreneurs (P08) to advance organizational goals.

Responsiveness to process change needs to be fostered as changes in processes will be much more common due to the high variability of the contexts they are executed in (P04). Further, flat hierarchies (P21) will offer low-level workers more opportunities to modify processes, requiring an organization-wide commitment to acting in the best interest of processes stakeholders. Organizations will have to embrace the challenge that processes need to be constantly changed (Schmiedel et al., 2014).

The capability area *process values and beliefs* will undergo changes, too. As workers become increasingly independent from organizational procedures and hierarchies (P04, P13) and observe ethical and work values (P01), their understanding of processes will diverge. Another challenge will be to avoid the thinking-inside-the-box-mentality (P08). The widespread use of collective intelligence mechanisms for decision-making (P15) will also require a high level of commitment (Schmiedel et al., 2014).

In the capability area *process attitudes and behaviors* workers' willingness to be thoroughly engaged in processes may be endangered by an increasing separation of work from physical locations and/or time (P04). An entrepreneurial culture (P08) implies that process improvement will be initiated more often due to strong competition among process teams. Moreover, workers' acceptance of improvement priorities set via collective intelligence (P15) will have to be established.

Leadership attention to process management will play a less significant role as there will be fewer management levels (P21). Rather, it will be crucial that everybody in the organization reflect on processes and adopt a process-oriented mentality.

We do not expect any significant changes in the capability area *process management social networks.*

BPM as a corporate capability needs to…
1. …support the shift from individual processes to process portfolios.
2. …offer methods that address the blurring boundaries between processes and projects.
3. …enable the integration of smart connected things into processes.
4. …enable levering process data for value creation and innovation.
5. …support the handling of agile and knowledge-intensive processes.
6. …ensure process continuity in rapidly changing ecosystems.
7. …maintain the focus on human capabilities in addition to process technology.
8. …promote the integration of boundary-spanners into process teams.
9. …enable the integration of process partners across value networks.
10. …foster the openness of processes towards external ideas and work practices.

Table 4. Overarching BPM capability topics in connection with the future of work

5 Discussion and Conclusion

With the objective of complementing existing initiatives on the future of BPM, we investigated how BPM as a corporate capability needs to evolve in light of the future of work. To this end, we first performed a structured literature review and derived 23 propositions that capture constitutive features of

the future of work as included in the existing body of knowledge. In order to examine in a structured manner how the future of work impacts BPM, we then asked a panel of BPM experts to map these propositions to the six factors of Rosemann and vom Brocke's (2015) BPM capability framework, which captures how BPM is conceptualized today. Finally, based on the mapping of propositions to BPM factors, we discussed how the capability areas included in the BPM capability framework will change. Thereby, we highlighted overarching topics which we think will shape BPM as a corporate capability in light of the future of work.

Our study revealed that the future of work will influence our understanding of how BPM can help organizations to ensure effective and efficient work. In the future, BPM will have to deal with processes that are increasingly agile, knowledge-intensive, and data-driven. Work will be characterized by a rapid change of teams, tasks, and goals. It will also be carried out anytime anyplace. Digital affordances will enable and require the fast and far-reaching reorganization of processes. Further, organizations will increasingly utilize market principles, flatten their hierarchies, and decentralize decision-making authorities. We found that the future of work will particularly affect the BPM factors culture, governance, and people. Nevertheless, to live up to these new developments, BPM as a whole needs to evolve. The increasing fraction of project-like and unstructured work will make the distinction between processes and projects blur. Supporting such work requires hybrid methods that build on BPM and project management. Moreover, BPM will have to ensure the smooth functioning of processes confronted with high volatility in teams and ecosystems as well as enable the seamless integration of external partners across value networks. BPM will also have to capitalize on the growing potential of digital technologies to complement human participation in processes and to leverage process data for innovation. At the same time, a human-centric culture that fosters the leading role of people in processes is indispensable since process outcomes will require significant creative, cognitive, entrepreneurial, and boundary-spanning skills. Finally, BPM needs to be open toward ideas and work practices from the outside to avoid complacency with internal procedures and to capitalize on improvement opportunities.

This study is beset with limitations that stimulate further research. As already argued, the propositions that capture constitutive characteristics of the future of work have different levels of adoption in current work practices, a different breadth in scope, and may be viewed differently depending on how central they are for the future of work. Even though the propositions have been validated by two experts from the field of the future of work as well as by additional ten BPM experts who mapped them to the BPM factors, we deem a broader literature review as well as the involvement of more BPM experts in the exploration and validation of propositions regarding the future of work a worthwhile endeavor. Furthermore, we believe the involvement of experts with a more diversified academic as well as professional background will be beneficial for the mapping procedure. When reasoning about how BPM as a corporate capability needs to evolve in light of the future of work using Rosemann and vom Brocke's (2015) BPM capability framework as a reference point, we neither added nor discarded individual capability areas. More importantly, though based on the propositions, our review of the BPM capability framework suffers from subjective influences, as our author team and the involved expert team still is rather small. In order to mitigate these subjective influences and to trigger a broad discussion about the future of BPM in the future of work, we recommend mobilizing more BPM experts from academia and industry in a community-wide initiative. As Rosemann and vom Brocke's (2015) BPM capability framework has been conceived based on a global Delphi study, this method may also shape up sensible for advancing the insights of our study. Thus, we invite fellow researchers to challenge and extend our conclusions and, thereby, help conceptualize the future of BPM in the future of work.

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