A MATCH MADE IN HEAVEN? EMPOWERING EFFECTS OF BUSINESS PROCESS MANAGEMENT AND DIGITAL INNOVATION CAPABILITIES

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A MATCH MADE IN HEAVEN? EMPOWERING EFFECTS OF BUSINESS PROCESS MANAGEMENT AND DIGITAL INNOVATION CAPABILITIES

Research Paper

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Abstract

Business Process Management (BPM) and Digital Innovation (DI) are at the forefront of understanding and shaping organizational change in the digital age. Yet BPM still struggles to fully embrace an opportunity-driven mindset while DI is rarely institutionalized as a structured process. To overcome challenges, combining efforts of both domains promises great benefits. Hence, we take a dialectic view on the intersection of BPM and DI and conduct two structured literature reviews to derive eight empowering effects of BPM and DI capabilities on Digital Process Innovation and the DI Process. Drawing from dialectic theory, our study contributes to the descriptive and explanatory knowledge on BPM and DI, answering calls to advance research at their intersection. Our findings provide a basis for further theorizing and insights on how existing knowledge on BPM and DI can inform research at their intersection. Practitioners can use our results to synergize their BPM and DI capabilities.

Keywords: Business Process Management, Digital Innovation, Capabilities, Dialectic Theory

1 Introduction

In the digital age, organizations need to leverage the potential of digital technologies to keep up with everchanging customer demands and industry spanning competition (Oberländer et al., 2021). On the one hand, organizations can exploit digital technologies to improve their current way of creating value (Beverungen et al., 2021), e.g., by enhancing business processes (Kohn and Harborth, 2018). On the other hand, organizations need to be able to seize and discover digital opportunities leading to products, services, or business models requiring novel ways of value creation (Nambisan et al., 2017). In Information Systems (IS) research, the domains of Business Process Management (BPM) and Digital Innovation (DI) are at the forefront of understanding and shaping related organizational change. BPM is “the art and science of overseeing how work is performed in an organization to ensure consistent outcomes and to take advantage of improvement opportunities” (Dumas et al., 2018, p. 1). With the rise of digital technologies and its unique characteristics of re-programmability, homogenization of data, and self-referentiality (Yoo et al., 2010), BPM research identified many implications for its domain, e.g., a higher need for an opportunity-driven mindset (Rosemann, 2014; Kerpedzhiev et al., 2021), and new research topics emerged. For example, digital process innovation (DPI) aims at leveraging digital technologies for the innovative (re-)design of business processes (Lohoff, 2022; Nambisan et al., 2017). In contrast to BPM, DI evolved as a new research domain due to the societal and economic effects of digital technologies (Nambisan et al., 2017). DI is “the creation or adoption, and exploitation of an
inherently unbounded, value-adding novelty (e.g., product, service, process, or business model) through the incorporation of digital technology” (Hund et al., 2021, p. 6). To successfully engage in DI, organizations need new capabilities that enable the discovery and seizing of digital opportunities (Buck et al., 2021). Studies often conceptualize DI as an highly iterative, creative but also unpredictable process that comprises the four actions initiate, develop, implement, and exploit (Kohli and Melville, 2019). Due to the therefore needed flexibility in and around the DI process (Baiyere et al. 2020), organizations often struggle to institutionalize it into a business process that can be consistently steered, monitored and repeated (Kleider et al., 2021).

Despite the interdisciplinary nature of topics such as DPI or the DI process, BPM and DI have been treated as separate domains for a long time. At first glance, the desire of BPM for consistency and stability seems to conflict the focus of DI on change and flexibility (Baiyere et al., 2020; Mendling et al., 2020). Nevertheless, recent IS research has developed interest in bringing BPM and DI together, highlighting that both can be complementary and beneficial to each other (Mendling et al., 2020; Ahmad and van Looy, 2020). Studies suggest, for example, that we should learn more about the strategic alignment of BPM and DI (van Looy and Poels, 2019), related success factors (van Looy, 2018), or new capabilities drawing from both domains (Grisold et al., 2021; Ahmad and van Looy, 2020). Most importantly, mature knowledge on the complementary nature of BPM and DI is key not only to address challenges arising at their intersection but to alleviate both domains to new heights (Ahmad and van Looy, 2019; Mendling et al., 2020). While DI can empower BPM to become more explorative and opportunity-driven (Mendling et al., 2020), BPM can help DI in institutionalizing a consistent and repeatable DI process (Kleider et al., 2021).

Despite these promising research avenues, we still lack a detailed understanding of how BPM and DI can empower each other (Grisold et al., 2021). Research at their intersection often takes a one-sided view with a predominant focus on how DI affects BPM, e.g., Baiyere et al. (2020). Nevertheless, there are also benefits in leveraging BPM for DI, as shown in Kleider et al. (2021). Further, we need to consider that BPM and DI are two large research domains with a mature body of knowledge. We should not neglect their long history but rather investigate how existing knowledge can inform research at the intersection. Thus, we ask the question: What are empowering effects of BPM on DI and vice versa?

As a response, we take a dialectic view as a theoretical lens on the intersection of BPM and DI. Dialectic theory builds on the assumption that organizations face divergent forces with conflicting values vying for dominance (Benson, 1977; van de Ven & Poole, 1995). The resulting conflicts between these forces trigger changes in the form of synthesis (Poeppe1buss et al., 2015). Similarly, studies such as Mendling et al. (2020) or Baiyere et al. (2020) have shown that although assumptions in BPM and DI seem opposing and conflicting, both domains’ knowledge can ultimately empower each other. Following explicit calls for research by Grisold et al. (2021), we thereby argue that BPM and DI capabilities take a vital role in shaping the convergence and synthesis of both domains. Thus, we specifically aim to conceptualize the empowering effects of BPM and DI capabilities. To this end, we conduct two structured literature reviews. First, we analyze the literature at the intersection of BPM and DI, finding that related challenges gravitate around the topics of DPI and the DI process (i.e., the conflicts from a dialectic view). Focusing on both topics as our subjects of analysis, we are particularly interested in how DI capabilities can empower DPI and how BPM capabilities can empower the DI process. Second, we analyze the isolated literature on BPM and DI to identify a set of capabilities to build on. Combining the results from both literature reviews, we conceptualize eight empowering effects of BPM and DI capabilities that help to address challenges in DPI and the DI process (i.e., the synthesis from a dialectic view). Drawing on dialectic theory, our study contributes to the descriptive and explanatory knowledge at the intersection of BPM and DI. Our results provide a basis to academics for further theorizing on BPM and DI, showcase the value of dialectic theory for advancing research at the intersection of BPM and DI, and help practitioners engaging in DPI or aiming to institutionalize a successful DI process.

In Section 2, we elaborate on our research approach. We outline key findings regarding the theoretical background underlying our results in Section 2, before presenting the eight empowering effects of BPM and DI capabilities in Section 3. Finally, we discuss the contribution and implications of our work in Section 5 and conclude with limitations and ideas for future research in Section 6.
2 Research Approach

Taking a dialectic view (Poeppelbuss et al., 2015), we aim to detail challenges arising in BPM and DI (i.e., conflicts) and conceptualize the empowering effects of BPM and DI capabilities that help to address them (i.e., synthesis). Our corresponding research approach incorporated two steps. First, we conducted two structured literature reviews (Wolfswinkel et al., 2013; vom Brocke et al., 2015). One review focused on the intersection of BPM and DI (Section 3.1) and arising challenges, while the other focused on identifying a set of BPM and DI capabilities to build on. Second, we combined the results from both literature reviews to iteratively derive eight empowering effects of BPM and DI capabilities.

<table>
<thead>
<tr>
<th>Step 1: Structured Literature Reviews</th>
<th>Literature Review #1</th>
<th>Literature Review #2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Search String</strong></td>
<td>&quot;business process management&quot; OR &quot;process management&quot; AND &quot;digital innovation&quot;</td>
<td>AB=&quot;business process management&quot; OR &quot;process management&quot; OR &quot;digital innovation&quot; AND TI=(Capabilit*)</td>
</tr>
<tr>
<td><strong>Databases</strong></td>
<td>Web of Science, AIS eLibrary</td>
<td>VHB - JOURQUAL3 'B' and above ranking</td>
</tr>
<tr>
<td><strong>Initial Sample</strong></td>
<td>n = 96</td>
<td>n = 94</td>
</tr>
<tr>
<td><strong>Pass Inclusion Criteria</strong></td>
<td>n = 20</td>
<td>n = 35</td>
</tr>
<tr>
<td><strong>Pass Full-Text Screening</strong></td>
<td>n = 8</td>
<td>n = 13</td>
</tr>
<tr>
<td><strong>Forward &amp; Backward Search</strong></td>
<td>n = 5</td>
<td>n = 6</td>
</tr>
<tr>
<td><strong>Final Sample</strong></td>
<td>n = 13</td>
<td>n = 19</td>
</tr>
<tr>
<td><strong>Key Outcome</strong></td>
<td>8 challenges in DPI and the DI process</td>
<td>2 BPM and DI Capability Frameworks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2: Deriving Empowering Effects at the Intersection</th>
<th>2.1 Axial and selective coding iterations to assign capabilities to challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>→ Utilized Codes: Capabilities according to Buck et al. (2021) and Kerpedzhiev et al. (2021) from Step 1</td>
</tr>
<tr>
<td></td>
<td>→ Criterion: A capability is assigned, if it can provide meaningful help in addressing the challenge</td>
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<tr>
<td></td>
<td>2.2 Axial and selective coding iterations to conceptualize eight empowering effects and corresponding rationales</td>
</tr>
<tr>
<td></td>
<td>→ Utilized Codes: Mapped capabilities from 2.1</td>
</tr>
<tr>
<td></td>
<td>→ Criterion: All authors agree on interrelations, derived empowering effects, and rationales (theoretical saturation)</td>
</tr>
<tr>
<td><strong>Key Outcome</strong></td>
<td>8 empowering effects substantiated by 16 rationales addressing challenges in DPI and the DI process</td>
</tr>
</tbody>
</table>

Table 1. Two-Step Research Approach.

2.1 Structured Literature Reviews

We conducted two structured literature reviews in the databases Web of Science and AIS eLibrary covering IS and other fields. As research outlets, we focused on journals and proceedings with a VHB-JOURQUAL3 ‘B’ and above ranking. We used the VHB JOURQUAL as a reference for outlet quality because this ranking is broad, i.e., includes IS conferences and relevant BPM journals alongside the AIS Basket of Eight, is based on peer assessment of publication impact, and is driven by the business research community (VHB, 2023). By doing so, we kept the initial search focused, but also screened and selectively added publications outside of this ranking to avoid missing knowledge relevant to our research question (vom Brocke et al., 2015). We included completed research papers composed in English and excluded studies published prior to 2010 to guarantee timeliness. In 2010, the DI term was coined by the still highly regarded work by Yoo et al. (2010) and has since passed into everyday research parlance. For BPM, in 2010 the research focus started to shift from “conceptualizing BPM and [...] concrete BPM techniques, methods, and information systems [...] to developing BPM capability” (Poeppelbuss et al., 2015, p. 2).

For the first literature review, we defined a search string focusing on the intersection of BPM and DI, aiming to learn more about how both domains interrelate and understand related challenges. As this intersection is a fairly new field of research (Mendling et al., 2020), we kept the keywords as broad as possible. To decide whether the resulting 96 studies provide knowledge relevant to our research question, we screened the studies’ titles, abstracts, and keywords (vom Brocke et al., 2015). We then screened the full text of the remaining 8 studies, performed a forward and backward search, and ended with a final set of 13 studies. All three authors read the 13 studies and used open coding (Wolfswinkel et al., 2013) to extract insights. We then met in regular workshops to discuss our open codes, and applied
axial and selective coding techniques to further specify challenges at the intersection of BPM and DI (Wolfswinkel et al., 2013). We found that most challenges gravitate around the DPI and the DI process, which we therefore chose as our two subjects of analysis. To further structure the challenges, we derived the four areas people, design, infrastructure (Baiyere et al., 2020), and governance (Kleider et al., 2021) from the literature. For the second literature review, we followed the same procedure, this time focusing on research on BPM and DI capabilities. The initial search yielded 94 results. For the final selection of 19 studies, we narrowed down our search to studies that do not address single BPM- or DI-related capabilities, but structure a set of capabilities, e.g., capability frameworks. As a result, we identified two frameworks providing a comprehensive overview of the current state of research, i.e., Buck et al. (2021) and Kerpedzhiev et al. (2021), as basis for the next research step. We present key findings of the literature reviews as the theoretical background underlying our results in Section 3.

2.2 Deriving Empowering Effects at the Intersection of BPM and DI

The second step aimed at conceptualizing empowering effects of BPM and DI capabilities serving as a synthesis to solve the challenges that arise in DPI and the DI process (van de Ven and Poole, 1995). To ensure that all three authors had a shared understanding of the set of capabilities, we described each capability based on Buck et al. (2021) and Kerpedzhiev et al. (2021). Next, each author independently mapped capabilities to challenges. A capability should be mapped to one or multiple challenges if it can provide meaningful help in addressing the challenge, e.g., by reducing negative consequences or preventing the challenge from arising. Not all capabilities had to be mapped. Each author used our set of open codes to inform the mapping process with existing ideas in the literature. Then, we conducted two workshops in the author team to compare our results. In case of disagreement, we again drew on our open codes or adjusted misleading capability descriptions to come to a joint decision.

Thereafter, we aggregated our findings towards a meaningful conceptualization of how capabilities can empower DPI and the DI process. We focused on one challenge at a time and considered mapped capabilities as new “open codes”. Again applying selective and axial coding (Wolfswinkel et al., 2013), one author initially analyzed the capabilities’ effects on the challenges in the four areas and determined interrelations between capabilities, e.g., whether some of them have a reinforcing or similar effect on a specific challenge. A second author checked and revised the findings. Finally, the whole author team discussed and clustered interrelations between capabilities and developed them towards higher levels of abstraction. As results, we conceptualized eight empowering effects (see Section 4), one for each challenge in DPI and the DI process. Further, we substantiated each effect by a set of rationales. Each rationale underpins how underlying capabilities help to address the challenge and fuel the empowering effect. The rationales reference empowering capabilities, i.e., DI capabilities that address challenges in DPI and BPM capabilities that address challenges in the DI process, and supported capabilities, i.e., capabilities from the “opposing” discipline also addressing the challenge. We refined the contents of each empowering effect and rationale, e.g., by iteratively re-reading studies from our set, until theoretical saturation was reached and no novel insights emerged (Wolfswinkel et al., 2013).

3 Theoretical Background

We now present key insights from both literature reviews, providing details on related research and on important decisions in our research process, e.g., on the two chosen capability frameworks that we built on. These insights underly our main results (i.e., the empowering effects) presented in Section 4.

3.1 A Dialectic View on the Intersection of BPM and DI

The dialectic theory is one of four basic types of process theories (van de Ven and Poole, 1995) explaining change and capability progress (Poepelbuss et al., 2015) in organizations. It builds on the basic assumption that within an organization, competing forces act like thesis and antithesis and thus create a conflict. This conflict can be solved by a synthesis which is “a novel construction that departs from both the thesis and antithesis” (van de Ven and Poole, 1995, p. 517). Existing literature has already
taken a comparable perspective at the interface of BPM and DI (e.g., Mendling et al. 2020, Baiyere et al. 2021) by examining how opposing assumptions and conflicts between both domains can be resolved. Accordingly, we use the dialectic view to identify challenges between BPM and DI (conflict) and conceptualize the empowering effects of BPM and DI capabilities addressing them (synthesis).

Regarding potential conflicts, research at the intersection of BPM and DI highlights many arising challenges. For instance, Mendling et al. (2020) discuss how BPM and DI challenge each other’s fundamental assumptions and propose a set of convergent assumptions. Further, Baiyere et al. (2020) outline how fundamental logics of BPM evolve in the context of DI, changing the way how processes should be designed, agents should behave, and infrastructure should be built (Baiyere et al., 2020). Thereby, challenges at the intersection of BPM and DI gravitate around DPI and the DI process, i.e., our subjects of analysis. For example, continuous DPI leads to higher complexity in the process and IT landscape, which makes the application of existing BPM skills, practices and tools more difficult and challenges well-known workflows of BPM actors (Lohoff, 2022). For DI processes, Kleider et al. (2021) found that actors may find process-oriented thinking and strict governance mechanisms around DI actions disadvantageous, challenging DI’s iterative and creative nature. In sum, we were able to conceptualize four challenges in each subject of analysis, structured along a set of four areas that we derived from the literature: People, design, infrastructure (Baiyere et al., 2020), and governance (Kleider et al., 2021). We present all the identified challenges in DPI and the DI process in Section 4.

In addition to challenges, existing literature also points to significant benefits from combining efforts in both domains (e.g., van Looy and Poels, 2019; van Looy, 2018), highlighting the enabling role DI can have for BPM and vice versa (Grisold et al., 2021; Ahmad and van Looy, 2020). On the one hand, DI activities can be scoped within BPM initiatives to support the improvement and redesign of business processes with digital technologies (van Looy and Poels, 2019; Grisold et al., 2021). In this regard, DPI is a particularly relevant topic (Lohoff, 2022) and has been discussed, for example, in terms of explorative BPM (e.g., Grisold et al., 2022), i.e., the inclusion of business and technology trends as well as customer expectations in the (re)design of processes. On the other hand, BPM can enable DI as designing and implementing processes is key to driving organizational change (Grisold et al., 2021). Further, considering DI as a process, BPM can provide the necessary skills, practices and tools to design, implement, monitor, and continuously improve the DI process (Kleider et al., 2021; Kohli and Melville, 2019). For instance, Kleider et al. (2021) found that BPM can support the DI process in terms of strategic alignment, governance, methods and IT, people, and culture. In sum, prior research offers interesting and valuable ideas on synergies between BPM and DI (Grisold et al., 2021; Mendling et al., 2020) and how challenges in DPI and the DI process can be addressed. We aim to further detail and substantiate these ideas by focusing on empowering effects of BPM on DI capabilities (Grisold et al., 2021). Hence, we now take a look at existing literature on capabilities and their implications in the domains of BPM and DI, aiming to derive relevant capabilities that are vital for the development of empowering effects.

### 3.2 Capabilities of Business Process Management and Digital Innovation

An organization’s resource base determines the competitive advantage that it can gain over competitors and assists in responding to market opportunities (Barney, 1991; Wade and Hulland, 2004). This resource base incorporates capabilities and assets (Wade and Hulland, 2004). While assets are tangible or intangible objects, capabilities are patterns of action that allow actors to use these assets to create and provide products, services or processes (Wade and Hulland, 2004; Kerpedzhiev et al., 2021; Oberländer et al., 2021). Since organizations and the environment in which they operate change, capabilities must adapt to changing circumstances. In this context, the term dynamic capabilities was coined. By sensing, seizing and transforming opportunities (Teece, 2007), dynamic capabilities enable an organization to maintain and change its own resource base (Helfat and Peteraf, 2009). In the context of BPM and DI, capabilities are a vital topic of discussion. They form the basis for any activities of an organization to create value (Kerpedzhiev et al., 2021; Buck et al., 2021) and to apply knowledge from both domains in practice (Amit and Schoemaker, 1993; Barney, 2001; Oberländer et al., 2021). Thus, literature on BPM and DI already provides a mature body of knowledge that we can build on to derive empowering effects.
Research on capabilities has always been at the heart of BPM (Rosemann and vom Brocke, 2015). Practicing successful BPM is tied to capabilities for identifying, designing, implementing, executing, monitoring, and improving business processes (Recker and Mendling, 2016). Rosemann (2014) postulated that existing BPM capabilities are largely efficiency-focused and aim at consistent execution of business processes (exploitative BPM), lacking the integration of opportunity-oriented capabilities, e.g., for explorative BPM. Studies often collect and organize BPM capabilities in frameworks, whereby de Bruin and Rosemann (2007) have built one of the most prominent ones structuring 30 capability areas around the six BPM factors strategic alignment, governance, methods, information technology, people, and culture. More recently, Kerpedzhiev et al. (2021) investigated BPM capabilities in the digital age to update de Bruin and Rosemann’s (2007) capability framework in light of novel digital phenomena.

Research on DI capabilities builds on the notion that organizations need enhanced or new capabilities due to the impact of digital technologies (Buck et al., 2021; Yoo et al., 2010). Beyond DI, there has been a vibrant discussion in IS literature on digital capabilities (e.g., Wang et al., 2022; Wiesboeck, 2018). Digital capabilities are “skills and attitudes that individuals and organizations need to develop in today’s digitalized world” (Hartono and Halim, 2020, p. 616). However, research explicitly outlining DI capabilities is scarce (Buck et al., 2021). Among the few, Buck et al. (2021) drew from high-quality scientific articles to examine capabilities relevant for DI and aggregated findings into a DI capability framework. Their framework consists of nine capability layers (i.e., innovation, management, process, product, customer, market, network, knowledge, and IT related layers), capability areas and capabilities.

In sum, we find that the works of Kerpedzhiev et al. (2021) and Buck et al. (2021) are timely approaches that structure and synthesize a wealth of high-quality research on BPM and DI capabilities. Hence, we rely on both studies to derive empowering effects of BPM and DI. In Table 2, we list relevant capabilities from their frameworks with an ID to reference them in Section 3. Relevant in this context means that the DI or BPM capability has the potential to have an empowering effect on BPM or DI. After careful consideration and analysis of the definitions provided in the studies, we sorted out five DI capabilities and four BPM capabilities. Thus, from the work of Kerpedzhiev et al. (2021), we included a total of 26 capabilities and from Buck et al. (2021) 21 capability areas. Regarding the latter, we chose to focus on capability areas instead of the much more small-scale capabilities. Thereby, we ensure comparability as the areas are at a similar level of abstraction with the capabilities of Kerpedzhiev et al. (2021). For reasons of simplification, we will only refer to ‘DI capabilities’ instead of ‘DI capability areas’.

<table>
<thead>
<tr>
<th>BPM Capabilities (Kerpedzhiev et al., 2021)</th>
<th>DI Capabilities (Buck et al., 2021)</th>
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<tbody>
<tr>
<td>B1 Customer Centricity</td>
<td>B14 Process Data Governance</td>
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<tr>
<td>B2 Process Centricity</td>
<td>B15 Process Data Analytics</td>
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<tr>
<td>B3 Evidence Centricity</td>
<td>B16 Advanced Process Automation</td>
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<tr>
<td>B4 Change Centricity</td>
<td>B17 Process Positioning</td>
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<tr>
<td>B5 Employee Centricity</td>
<td>B18 Process Portfolio Management</td>
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<tr>
<td>B6 Customer Literacy</td>
<td>B19 Process Compliance Management</td>
</tr>
<tr>
<td>B7 Digital Literacy</td>
<td>B20 Process Architecture Governance</td>
</tr>
<tr>
<td>B8 Data Literacy</td>
<td>B21 Multi-Purpose Process Design</td>
</tr>
<tr>
<td>B9 Innovation Literacy</td>
<td>B22 Contextual Process Governance</td>
</tr>
<tr>
<td>B10 BPM and Process Literacy</td>
<td>B23 Strategic Process Alignment</td>
</tr>
<tr>
<td>B11 Roles and Responsibilities</td>
<td>B24 Adaptive Process Execution</td>
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<tr>
<td>B12 Process Customer and Stakeholder Alignment</td>
<td>Agile Process Improvement</td>
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<tr>
<td></td>
<td>D1 Development of capabilities</td>
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<td>D2 Knowledge gathering</td>
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<td>D3 Ambidexterity</td>
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<td>D6 Customer Service</td>
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<td>D7 Market-focused learning</td>
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<td>D8 Market shaping</td>
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<td>D9 New product development</td>
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<td>D10 Research and Development</td>
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<td>D11 Project management</td>
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<td>D12 Performance management</td>
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<td>D13 Information Management</td>
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</table>

Table 2. Business Process Management and Digital Innovation Capabilities.
4 Results

We now present our primary research results, i.e., four empowering effects of DI capabilities on DPI and four empowering effects of BPM capabilities on the DI process. For each effect, we describe the addressed challenge that we initially derived from the literature. Each challenge concretizes how opposing assumptions and values of BPM and DI materialize in DPI or the DI process, and thus represents the conflict from a dialectic view (van de Ven and Poole, 1995). Further, we present the associated empowering effect which can alleviate or resolve the conflict and is therefore equivalent to the synthesis from a dialectic view (van de Ven and Poole, 1995). In addition, we specify rationales on how capabilities from one domain (“empowering capabilities”) support capabilities of the other (“supported capabilities”), shown in Table 3 and Table 4. We selectively refer to capabilities from Buck et al. (2021) and Kerpedzhiev et al. (2021) supporting our rationales (ID: Capability). For illustrative purposes, we provide real-world examples from BPM and digitalization cases by Urbach and Röglinger (2019) and vom Brocke and Mendling (2018).

4.1 Empowering Effects of Digital Innovation Capabilities

In BPM, people are expected to follow strict standards around processes (Baiyere et al., 2020). However, in the context of DPI, processes need to quickly adapt to change and digital opportunities, e.g., by integrating new digital technologies. These dynamics lower the degree of harmonization (Nambisan et al., 2017) and question procedural thinking in BPM (Baiyere et al., 2020). This triggers a challenge as people engaging in DPI need to have the right skills and mindset to quickly design, implement and adapt to changing processes, challenging the desire in BPM to build and follow strict business process models. In response to this challenge, DI capabilities (e.g., D7: market-focused learning, D2: knowledge gathering) empower DPI by helping people understand why change due to new digital opportunities is needed. More precisely, DI capabilities empower people to better observe the process environment, e.g., changing market dynamics, and anticipate necessary change (Annarelli et al., 2021; Buck et al., 2021). Thereby, DI capabilities excel at collecting large amounts of process data and transforming it into valuable knowledge. BPM actors can use this knowledge to become more agile and confident in making explorative decisions consistent with data-based evidence and adapt their doing accordingly (Tortora et al., 2021; Buck et al., 2021), e.g., by implementing an explorative process design based on customer data. A hospital in Sri Lanka demonstrated this effect in the context of people-centric process innovation (Bandara et al., 2018). Based on real data of a patient care process, the hospital mapped, analyzed, and improved the process by introducing a new patient records management system.

Process design in BPM traditionally follows an inside-out and efficiency-driven approach (Rosemann, 2014), applying pre-defined standards for modeling (Baiyere et al., 2020). In DPI, process design is not deterministic, but unfolds over time as, for example, actors are given more freedom in execution (Mendling et al., 2020; Kohli and Melville, 2019). Further, emerging digital opportunities may require radical re-design of processes. This triggers a challenge as process design in DPI needs to be more flexible in allowing freedom for adaptation, challenging existing design approaches in BPM and the desire for predefined structures and models. In response to this challenge, DI capabilities empower DPI to explore new process designs. DI capabilities thereby excel at recognizing new digital opportunities, e.g., from an organization’s network in digital ecosystems (e.g., D18: network integration), and recombining resources into new process designs (e.g., D8: market-shaping), e.g., based on customer needs (e.g., D5: customer management) (Annarelli et al., 2021; Grisold et al., 2021). Finally, by constantly leveraging DI capabilities for opportunity-driven DPI (e.g., D21: process change), organizations gradually transform their process landscape design towards higher flexibility and freedom for adaptation (Buck et al., 2021; Yoo et al., 2010). A German online fashion retailer included customer feedback in the website engineering process to evaluate ideas for new digital customer interaction formats (e.g., virtual fitting). Therefore, the retailer selected and implemented customer-centric solutions improving the customer experience in ordering and delivery processes (Baier et al., 2019).

In terms of infrastructure, BPM aims for stability and alignment with business process models (Baiyere et al., 2020). Due to DPI, more complex interconnected processes emerge requiring change in the
infrastructural landscape (Lohoff, 2022), e.g., a higher focus on dynamic up- and downscaling (Nambisan et al., 2017; Hund et al., 2021) or on processing large volume of data (Yoo et al., 2012). This triggers a challenge as DPI needs flexible infrastructure that can keep up with gradually unfolding and changing processes, challenging the focus of BPM on infrastructural stability and alignment with process models. In response to this challenge, DI capabilities (e.g., D13: information management, D14: IT infrastructure) empower DPI by creating infrastructural components that connect entities and people around processes via digital systems and interfaces (Buck et al., 2021; Zhen et al., 2021). Due to the generative nature and layered modular architecture of DI (Yoo et al., 2010), DI capabilities enable infrastructure composed of loosely coupled modules that can be flexibly aligned with new conditions for processes. Further, DI capabilities (e.g., D16: outside-in IT, D15: inside-out IT) support building a broader, infrastructure-backed knowledge base that pools and analyzes data resources from inside the organization and the external environment (Annarelli et al., 2021). A real-world example is a laboratory, where processes handling the information flow of incoming orders had to become more flexible due to their content- and market-related complexity (e.g., country-specific regulations). The laboratory increased flexibilization by building an adaptable infrastructure that encompassed configuration mechanisms and modular software architectures (Duelli et al., 2018).

BPM governance aims at consistency in structures, roles, responsibilities, and metrics (Spanyi, 2015). Governance of DPI should enable flexibility and agility to respond quickly to arising digital opportunities (van Looy and Poels, 2019). To do so, organizations need to be able to involve changing and interdisciplinary actors as well as flexibly apply process redesign methods that fit the opportunity at hand. This triggers a challenge as governance of DPI is characterized by high complexity and the need for flexibility of roles, methods, and structures, challenging the desire in BPM for consistent governance of all process improvement initiatives. In response to this challenge, DI capabilities (e.g., D18: network integration, D17: alliance management) empower DPI by helping to versatilize the governance around it. More precisely, DI capabilities support meaningful integration of complex networks of interdisciplinary experts and excel at leveraging benefits of the resulting cross-disciplinary teams (van Looy, 2018). In doing so, new top management roles can be involved in decision-making, e.g., the Chief Digitalization Officer (Tumbas et al., 2018). In this regard, DI capabilities foster building an ambidextrous governance, enabling an organization to engage in exploitative and explorative process (re)design (Buck et al., 2021). An insurance company faced a changing insurance market, for which previously defined processes were no longer suitable. In response, they introduced a more flexible digital tool and replaced its comprehensive governance structure with a set of loose compliance rules. The adjustments led to greater flexibility in (re)designing processes and better adaptability to new environmental conditions (Kim et al., 2018).

4.2 Empowering Effects of Business Process Management Capabilities

In DI, people iteratively and flexibly follow the actions initiate, develop, implement and exploit (Kohli and Melville, 2019). However, actors need to be aware that DI is performed in an organization as a business process that needs to fit into a process landscape (Kleider et al., 2021). Actors are required to act and think in a process-oriented way, clashing with the view of DI being unbounded and unpredictable (Ramirez Rincon et al., 2020). This triggers a challenge as people in a DI process need to acquire knowledge in process-oriented thinking and doing, challenging the free-flowing nature of actions. In response to this challenge, BPM capabilities (e.g., B2: process centrivity, B10: BPM and process literacy) empower the DI process by fostering a process-oriented culture (Handayani and ER, 2019; Kerpedzhiev et al., 2021). Thereby, BPM capabilities help DI actors to commit to the DI process as defined and align their understanding of process-orientation (e.g., B12: process customer and stakeholder alignment). Specifically, BPM capabilities excel at lowering unpredictability of the DI process by building process-related knowledge, ensuring end-to-end process control in all DI actions and increased decision reliability by using analytical insights (Kerpedzhiev et al., 2021; Rosemann and vom Brocke, 2015). For example, an insurance company conducted a DI project to implement a data-driven decision-making system. To do so, the project team combined process-oriented know-how with know-how arising from collected data to shape their DI process (Scheffler and Wirths, 2019).
The design of DI actions can take different forms, e.g., as an organization might skip the development and directly implement a digital technology stemming from a partner in a digital ecosystem (Kohli and Melville, 2019). Further, DI actions are accompanied idea funneling, which can be excluded or added at any time based on a “fail fast” mentality (Kreuzer et al., 2022). In contrast, a DI process needs to follow certain standards, e.g., in terms of modeling (Aagesen and Krogstie, 2015), and be specific in advance about the actions to be performed. This triggers a challenge as the design of a DI process requires structured modeling of the sequence of DI actions and of the approach to idea funneling, challenging the desire for fully flexible execution of actions in DI. In response to this challenge, BPM capabilities (e.g., B21: multi-purpose process design, B16: advanced process automation) empower the DI process to model a repeatable DI process design with clearly defined decision points for idea funneling (Teece et al., 2016; Kerpedzhiev et al., 2021). Further, BPM capabilities (e.g., B24: adaptive process execution, B25: agile process improvement) can help to constantly exploit the chosen DI process design by looking for improvement opportunities (Kerpedzhiev et al., 2021). In this regard, BPM capabilities excel at showing the full range of process designs from which the most suitable one for the purpose at hand can be selected. For example, a hospital wanted to engage in DI. Due to the sensible context, it was of utmost importance to mitigate the unpredictability of DI by gradually refining the DI process and including exploitation opportunities rather than radical changes (Meister et al., 2019).

DI wants to build on digital infrastructure that enables connecting with a large pool of shared resources, e.g., technologies provided by partners in platform-based digital ecosystems (Lokuge et al., 2019; Nambisan et al., 2017). In a DI process, however, necessary infrastructural alignment limits its ability to connect freely with other systems (Baiyere et al., 2020). This triggers a challenge as the infrastructure of an institutionalized DI process needs to be aligned with existing architecture, challenging the desire of DI to recombine digital resources as needed. In response to this challenge, BPM capabilities (e.g., B13: process architecture management, B14: process data governance) empower the DI process to build the technical infrastructure needed for a full integration into the process landscape (Lederer Antonucci et al., 2021). To achieve this, a company in the passenger transportation industry implemented a bimodal IT setup that brought stability to their DI processes without eliminating the desire of DI for flexibility of digital infrastructure. They established a process-oriented IT infrastructure supporting both exploratory and exploitative DI processes (Fortmann et al., 2019). BPM capabilities can therefore help to define the technical and process-related boundaries within which DI can freely take place, e.g., enabling the integration of multiple streams of technology (Ferraris et al., 2018).

DI builds on a gradually unfolding set of actions, that blurs boundaries between products and industries, e.g., on digital platforms, as well as company and customers, e.g., via co-creation (Kreuzer et al., 2022; Hund et al., 2021). In contrast, building governance around a DI process requires an organization to define mechanisms for continuous steering and monitoring, standards for methods and documentation, and responsibilities for decision making (Kleider et al., 2021). This triggers a challenge as governance around DI processes wants to define clear structures, roles, responsibilities, and metrics, challenging the desire of DI to have as few boundaries as possible to be able to unfold over time. In response to this challenge, BPM capabilities (e.g., B20: process architecture governance, B17: process positioning) empower the DI process by helping to institutionalize it within a governance structure, including the definition of standards in the DI process for modeling, execution and decision-making. As a result, the DI process becomes more reliable and controllable. Further, BPM capabilities (e.g., B11: roles and responsibilities) ensure clearly defined roles and responsibilities through which actors can orchestrate the DI process. For instance, a telecommunication operator aimed to automate certain tasks in the company as part of a DI initiative. A key success factor for the implementation and acceptance of the DI process was the development of a governance structure with defined responsibilities enabling actors to make sensible decisions, e.g., on the reduction of headcount due to automation (Schmitz et al., 2019).
### Challenges in Digital Process Innovation and Empowering Effects of DI Capabilities

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<thead>
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<th>Challenge</th>
<th>Empowering effect of DI capabilities</th>
<th>Rationale for empowering effect</th>
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| **People**    | **Understand & Adapt**                | • DI capabilities excel at identifying adaptation needs to become more flexible  
                  • DI capabilities excel at applying knowledge for exploratory purposes  
                  Supported BPM capabilities: B1, B4, B6, B7, B8, B9  
                  Empowering DI capabilities: D1,D2, D3, D4, D5, D6, D7 |
|               | **Explore & Transform**               | • DI capabilities excel at exploring new process design options that arise from recombining resources, the external network or customers.  
                  • DI capabilities excel at driving the transformation of the process landscape through opportunity-driven process innovation  
                  Supported BPM capabilities: B16, B21, B24, B25, B26  
                  Empowering DI capabilities: D1, D3, D5, D6, D7, D8, D9, D10, D17, D18, D19, D21 |
| **Design**    | **Connect & Pool**                    | • DI capabilities excel at building a flexible, layered modular infrastructure linking stakeholders and enabling communication and exchange.  
                  • DI capabilities excel at building an infrastructure to bundle knowledge from inside and outside the company as well as provide and distribute this knowledge.  
                  Supported BPM capabilities: B14, B15, B20  
                  Empowering DI capabilities: D2, D3, D13, D14, D15, D16, D20 |
| **Infrastructure** | **Versatilize & Foster** | • DI capabilities excel at managing interdisciplinary teams by integrating, for example, a variety of methods and roles that are applied in a non-standardized manner.  
                  • DI capabilities excel at building an ambidextrous governance approach that creates a balance between efficiency-driven and innovation-driven activities.  
                  Supported BPM capabilities: B11, B13, B17, B18, B19, B20, B22, B23  
                  Empowering DI capabilities: D3, D4, D11, D12, D17, D18, D19 |

Table 3. Challenges in Digital Process Innovation and Empowering Effects of DI Capabilities.
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<tr>
<th>Challenge</th>
<th>Empowering effect of BPM capabilities</th>
<th>Rationales for empowering effect</th>
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| **People**   | Commit & Align | • BPM capabilities excel at strengthening commitment to an end-to-end process perspective as well as process-based decision-making.  
• BPM capabilities excel at building and nurturing a process-oriented mindset and a universally defined DI process. |
|              | People in a DI process need to acquire knowledge in process-oriented thinking and doing, challenging the free-flowing nature of actions | **Supported DI capabilities:** D1, D2, D3, D4, D7  
**Empowering BPM capabilities:** B2, B3, B5, B10, B11, B12, B16 |
| **Design**   | Model & Exploit | • BPM capabilities excel at building processes that run end-to-end enabling idea funneling.  
• BPM capabilities excel at identifying design options for DI process improvements |
|              | The design of a DI process requires structured modeling of the sequence of DI actions and of the approach to idea funneling, challenging the desire for fully flexible execution of actions in DI. | **Supported DI capabilities:** D3, D7, D8, D10, D17, D18, D19, D21  
**Empowering BPM capabilities:** B16, B21, B24, B25, B26 |
| **Infrastructure** | Build & Define | • BPM capabilities excel at creating an infrastructure that is oriented to process flows and integrates the DI process into the business process landscape.  
• BPM capabilities excel at defining technical and process-related boundaries of the infrastructure to establish continuous processes. |
|              | Infrastructure of an institutionalized DI process needs to be aligned with existing architecture, challenging the desire of DI to recombine digital resources as needed. | **Supported DI capabilities:** D13, D14, D15, D16, D20  
**Empowering BPM capabilities:** B14, B15, B20 |
| **Governance** | Institutionalize & Orchestrate | • BPM capabilities excel at building robust architectures and structures to institutionalize the DI process  
• BPM capabilities excel at creating structures, decision-making processes and role descriptions that enhance the repeatability and transparency of the DI process. |
|              | Governance around DI processes wants to define clear structures, roles, responsibilities, and metrics, challenging the desire of DI to have as few boundaries as possible to be able to unfold over time. | **Supported DI capabilities:** D3, D4, D11, D12, D18, D19  
**Empowering BPM capabilities:** B11, B13, B17, B18, B19, B20, B22, B23 |

*Table 4. Challenges in the Digital Innovation Process and Empowering Effects of BPM Capabilities.*
5 Discussion

5.1 Contribution

BPM and DI are seen as “two sides of the same coin [...] that have much to learn from, and offer to, each other” (Mendling et al., 2020, pp. 211–212). Hence, recent studies call for research at the intersection, highlighting the need to investigate how BPM and DI capabilities can empower one another (Grisold et al., 2021). As a first step to address this need, we investigated the question: What are empowering effects of BPM on DI and vice versa? As a response, we took a dialectic view on the intersection of BPM and DI and followed two steps. First, we conducted two literature reviews, in which we investigated challenges at the intersection of BPM and DI, and identified a set of capabilities to build on. Second, we combined the results from both literature reviews to derive eight empowering effects that help to address challenges in DPI and the DI process. DI capabilities empower DPI with the effects understand & adapt, explore & transform, connect & pool, and versatilize & foster. BPM capabilities empower the DI process with the effects commit & align, model & exploit, build & define, institutionalize & orchestrate. Finally, we substantiated the effects with rationales on how underlying (empowering) capabilities fuel them.

Our work makes two vital contributions. First, we contribute to the descriptive knowledge on the intersection of BPM and DI (Gregor, 2006). Taking a dialectic view, the eight empowering effects represent the synthesis addressing conflicts arising at the intersection of BPM and DI, and detailing how both domains can empower each other. We organize capabilities around the empowering effects, providing insights into which BPM and DI capabilities are particularly relevant to the intersection to build a synthesis between conflicting assumptions and values. Second, we contribute to explanatory knowledge at the intersection of BPM and DI (Leidner, 2018; Seidel and Watson, 2020). Thereby, the rationales provide a first explanation on how BPM and DI capabilities help to address arising challenges in DPI and the DI process. Thus, capabilities in both domains excel at specific purposes complementing and supporting mostly insufficient capabilities in the other domain (Grisold et al., 2021).

Based on these contributions, we can make two overarching observations for the intersection of BPM and DI. First, by structuring our results along the areas people, design, infrastructure, and governance, we find support for the underlying tenet in the literature that some areas benefit more from the intersection of BPM and DI. For BPM, DI capabilities are especially relevant to design and people as they excel at sensing and seizing digital opportunities, and driving an opportunity-driven mindset. For DI, BPM capabilities are especially relevant to infrastructure and governance as they excel at aligning processes with existing systems and tools, building structure, and defining responsibilities. While collaboration in other areas is also important, leveraging the empowering effects in these areas might be particularly beneficial. Second, we provide further insights into why research at the intersection of BPM and DI is the natural next step after isolated discussions in both domains. More precisely, we see that both domains are aware of the identified challenges in DPI and the DI process (e.g., Rosemann, 2014; Kleider et al., 2021). It is hence to no surprise that we also found (supported) capabilities for each empowering effect, relating to capabilities in BPM already targeted towards challenges in DPI and vice versa for DI capabilities and the DI process. However, the historical focus in both domains has led to the development of different strengths. Therefore, the (empowering) capabilities of the other domain are much more mature to address the challenges in DPI and the DI process.

5.2 Implications

The theoretical implications of our research are twofold. First, we contribute ground work of descriptive and explanatory nature, providing the first step towards more mature theories at the intersection of BPM and DI (Leidner, 2018; Seidel and Watson, 2020). For example, scholars could use our results to develop theories for explaining, i.e., type II (Gregor, 2006). In this regard, it might be interesting to analyze empirical data to refine the empowering effects, build more knowledge on whether and how the effects unfold in practice, and explain underlying mechanisms of the rationales in more detail. Further, our
results can be a basis for theories for design and action (i.e., type V) (Gregor, 2006), aiming to provide concrete guidance. A theory of design and action could be a set of actionable practices based on our empowering effects, guiding organizational initiatives to foster synergies between BPM and DI. As another example, scholars could develop a maturity model specifying what and how capabilities should be developed to leverage the empowering effects. Our results stress the importance to study synergies between BPM and DI beyond the more obvious areas, e.g., DI enabling an opportunity-driven mindset of BPM actors, in so far less researched areas, e.g., DI fostering an ambidextrous BPM governance. Further theorizing could thus be conducted on current understudied areas, e.g., the enabling role of BPM for the design of DI processes. As a second implication, we see potential for further application of the dialectic view to the intersection of BPM and DI. Using the dialectic view as a theoretical lens enabled us to clearly display the conflicts that arise between BPM and DI, and showed how their capabilities can provide a synthesis to resolve conflicts and alleviate both domains to new heights. We showcase the applicability of the dialectic view (van de Ven and Poole, 1995) in this context and provide an approach for further inquiries extending the application of the dialectic theory or draw on additional process theories, e.g., life-cycle, teleological, or evolutionary process theories (van de Ven and Poole, 1995). Applying multiple process theories to the same subjects of analysis “proves helpful for gathering a comprehensive picture” (Poeppelbuss et al., 2015, p. 2) and could be part of future research.

Regarding practical implications, our findings lay the foundation for practitioners to better understand challenges around DPI and the DI process and identify corresponding courses of actions. For example, practitioners can use the empowering effects to derive patterns or best practices on how their teams and departments responsible for BPM and DI can collaborate. Practitioners can use our results to decide on areas, for which collaboration between the BPM and DI units might be particularly beneficial, or even shift responsibility in certain areas between the units. Further, practitioners could map out which capabilities they currently possess and challenge for each capability whether people contribute with the right BPM and DI expertise. At last, becoming ambidextrous in a digital world is an important goal of many organizations. In this regard, BPM and DI traditionally represent the extremes of exploitation and exploration. Rather than thinking in terms of silos, our results highlight the value of bringing capabilities from both domains together, e.g., in interdisciplinary teams, as an important step towards ambidexterity.

6 Limitations, Future Research, and Concluding Remarks

As with any academic work, our study is beset with limitations stimulating future research. First, there are limitations related to our research focus. By limiting our research to DPI and the DI process, we narrowed the scope of analysis and neglected other subjects that are also relevant for the intersection of BPM and DI. For example, BPM also takes an enabling role for exploiting the output of DI processes such as new digital products that require updated business processes (Grisold et al., 2021). Thus, future research could investigate whether our empowering effects also correspond to these other subjects in BPM and DI. In this regard, scholars may also study how the empowering effects relate to the concept of dynamic capabilities, which has been found as particularly important for DI (Shen et al., 2021). Second, there are limitations related to our chosen research approach. For example, we might have missed relevant studies due to our inclusion and exclusion criteria. Further, although we performed several coding iterations independently before jointly discussing results, our approach to analyzing the literature was inherently subjective. We also conducted no evaluation of the empowering effects that go beyond the exemplary digitalization cases. Future research could thus evaluate our results, e.g., with empirical data, challenging the completeness and robustness of the empowering effects.

BPM and DI are at the forefront of understanding and shaping organizational change in the digital age. Combining efforts of the BPM and DI domains promises great benefits, but also requires much work to overcome challenges at the intersection and to uncover how synergies can be leveraged. We hope that our study is an important step towards bringing BPM and DI closer together as we see that they are not only two sides of the same coin, but also a match made in heaven.

We gratefully acknowledge the Bavarian Ministry of Economic Affairs, Regional Development and Energy for their support of the project “Fraunhofer Blockchain Center (20-3066-2-6-14)” that made this paper possible.
A Match Made in Heaven?

7 References


