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Abstract

Digital ventures face significant organizational challenges when scaling, including increasing sales and employee numbers, that withdraw resources from working on their market offerings. While digital entrepreneurship literature stresses the importance of creating processes that balance structure and flexibility to deal with these challenges, business process management (BPM) literature focuses on improving pre-designed business processes. We reconcile these perspectives in a structured literature review to explore how BPM can support digital venturing. We identify synergies and tensions between BPM and digital entrepreneurship and propose three avenues for future research. These include exploring ambidextrous BPM in digital ventures, treating digital venturing as a business process, and developing capabilities for balancing flexibility and structure. We contribute to information systems research by critically reviewing the literature on BPM and digital entrepreneurship and providing potential areas for future investigation.

Keywords: business process management, digital entrepreneurship, digital venturing

Introduction

Digital technologies profoundly affect entrepreneurial processes (Nambisan, 2017), giving birth to a new type of organization known as digital ventures. Digital ventures are young entrepreneurial firms working on new digital products or services (Lehmann et al., 2022). By leveraging and adding digital infrastructure, they can experience unprecedented growth rates (Huang et al., 2017). Fast entrepreneurial growth of digital ventures, however, often described as scaling (Huang et al., 2017), comes with severe organizational changes. One significant action leading to changes is the initial launch of a digital market offering. This event often marks a turning point for digital ventures since their focus shifts from creating their product to marketing and selling it (Lehmann & Recker, 2022). Hence, companies must establish more formalized structures "that allow for the commercialization of their product, ranging from the formation of new

departments, to the formalization of business processes, and hiring of new employees" (Lehmann & Recker, 2022, p. 71). Such organizational changes, often performed under time pressure, pose additional challenges to digital ventures as, with their rapid growth, they need to establish structured business processes to coordinate their activities (Tumbas et al., 2017b).

Recent literature on digital entrepreneurship and business process management (BPM) provides two contrasting views on the phenomenon of establishing business processes during the growth phases of digital ventures. Whereas digital entrepreneurship literature highlights that digital ventures must create formal processes while maintaining the necessary flexibility and agility (Tumbas et al., 2017b), the literature on BPM focuses on discovering and modeling existing business processes (Mendling et al., 2020). These perspectives have begun to explore the tension between structured business processes and the targeted flexibility of digital ventures (Tumbas et al., 2017b). However, there seems to be high synergy potential for BPM to support entrepreneurs in managing the organizational challenges digital ventures face when growing since BPM is an established means to improve an organization's operations in a systematic manner (Weske, 2012). Harb & Shang (2022) suggest investigating how information technology can facilitate the process of entrepreneurship itself. They see entrepreneurship as a process to convert ideas into businesses. We pick up this idea and conduct a structured literature review on the intersection of literature on BPM and digital entrepreneurship. Thereby, we aim to learn what role BPM can play in supporting digital ventures. Hence, we ask the research question: *"What is the role of BPM in the context of digital entrepreneurship according to the current body of the literature?"* From our synthesis of findings, we further develop a research agenda that hopefully provides a first idea of how business process research can contribute to helping navigate digital ventures' growth periods.

Thus, our paper analyzes theoretical lenses and emerging themes at the intersection of BPM and digital entrepreneurship. As a result, we identify tensions and synergies that characterize the relationship between BPM and digital entrepreneurship. Based on our findings, we make two contributions to information systems research. First, we critically review the literature between BPM and digital entrepreneurship. Second, we identify three research avenues, 1) ambidextrous BPM in digital ventures, 2) digital venturing as a business process, and 3) capabilities for balancing flexibility and structure. From a practical perspective, we hope that our paper contributes to helping entrepreneurs to navigate through organizational obstacles occurring during entrepreneurial growth.

The remainder of the paper is structured as follows. We begin presenting related work concerning BPM and digital entrepreneurship. Then, we illustrate a structured literature review as our research methodology, followed by our results showing the relationship between BPM and digital entrepreneurship. A research agenda is then derived from these results. Finally, we conclude the paper, including our study's limitations.

Related Work: BPM and Digital Entrepreneurship

Digital entrepreneurship research focuses on how digital technologies shape and are shaped by entrepreneurial processes, outcomes, and contexts (von Briel et al., 2021). Hence, it investigates the intersection of digital technologies and entrepreneurship (Nambisan, 2017).

The role of digital technologies in digital entrepreneurship presents an established field of research. Steininger (2018), for instance, introduces a classification scheme for IT-associated startups by considering the business model and its three pillars (infrastructure, product, and customer interface). The author differentiates between the use of IT as a facilitator (IT plays a role in the infrastructure pillar of the business model), IT as a mediator (IT plays a role in the infrastructure and customer interface pillar), IT as an outcome (IT plays a role in the infrastructure and product pillar), and IT as a ubiquity (IT plays a role in all three pillars). Furthermore, Tumbas et al. (2017a) analyze how "born digital" companies leverage digital technologies during rapid growth episodes. In addition, Tumbas et al. (2017b) analyze the tensions that digital ventures face when growing rapidly. They report on digital venture professionalization mechanisms and the role digital technologies play. Von Briel et al. (2021) introduce a framework for the role of digital technologies in entrepreneurship. According to the authors, digital technologies can be enabler, outcome, and context (or their combinations) of digital ventures. Von Briel et al. (2018) theorize about when and how digital technologies enable new venture creation processes. The authors introduce specificity and relationality to evaluate the role of technologies. Specificity describes to which degree digital technology is adaptable and malleable, and relationality which relationships digital technology can leverage to facilitate

its functionality. Also, the authors introduce mechanisms that enable new venture creation. Examples are compression (reduces the time required to act) and conversation mechanisms (reduces the resources required to act). Finally, von Briel et al. (2017) introduce propositions for the mechanisms concerning specificity and relationality. For example, they state that as the specificity of digital technologies increases, their potential for enabling compression and conservation mechanisms increases.

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., 2013, p. 1). Typical improvement goals are reductions in costs, execution times, and error rates (Dumas et al., 2013). According to Weske (2012), BPM is based on the observation that every product a company offers to the market results from several activities performed in a coordinated manner. Business processes are critical in organizing these activities and improving the understanding of their interdependence. These processes are defined as a series of activities executed to achieve a business goal in a coordinated and technical environment. While a single organization enacts each business process, it may interact with processes performed by other organizations. As such, BPM comprises a range of "concepts, methods, and techniques to support the design, administration, configuration, enactment, and analysis of business processes" (Weske, 2012, p. 5).

By implementing effective process management strategies, businesses can leverage digital technologies to generate positive outcomes and avoid being overwhelmed by the intensity of the generative change triggered by digital technology (Mendling et al., 2020). Vom Brocke et al. (2016) highlight the importance of context for BPM to unfold efficiently and effectively. In this regard, different authors research how BPM unfolds in the digital age. Baiyere et al. (2020), for instance, analyze how three important BPM logics – modeling (process), infrastructural alignment (infrastructure), and procedural actor (agency) – hold up in the context of digital transformations. Based on their findings, they propose new logics, which they describe as light touch processes (process), infrastructural flexibility (infrastructure), and mindful actors (agency). Furthermore, Imgrund & Janiesch (2019) find in an empirical study that current BPM practices are increasingly being replaced by adaptive and context-sensitive approaches that draw from agile methodologies and modular process improvement. Additionally, LeLoarne & Maalaoui (2015) research the evolution of business processes in high-tech companies through the theoretical lens of entrepreneurial bricolage and find that they rely on a trial-and-error approach.

Methodology: Structured Literature Review

To understand BPM's role in digital entrepreneurship, we conducted a systematic literature review (SLR) (Webster & Watson, 2002). Our paper sample focuses on a representative set of articles (Paré et al., 2015), thereby organizing prior research on the given topic and examining relationships to facilitate the development of new knowledge (Paré et al., 2015; Webster & Watson, 2002). Our review adheres to established protocols for conducting literature reviews (vom Brocke et al., 2009; Webster & Watson, 2002) and includes relevant publications in peer-reviewed journals and conferences while not claiming to be comprehensive. Therefore, our survey aims to be a critical review (Paré et al., 2015). We opted for a critical review to uncover existing literature deficiencies and to suggest future research directions (Paré et al., 2015). In the following, we describe our search process and our data analysis.

Search Process

Our topic – the intersection between BPM and digital entrepreneurship – is an interdisciplinary research field covering Management, Entrepreneurship, Information Systems, and Computer Science. Therefore, we queried multiple literature databases. We searched the Web of Science Core Collection (WoS), ScienceDirect (SD), AIS eLibrary (AISeL), IEEExplore (IEEE), and Scopus. Based on the approach by vom Brocke and Sinnl (2011), we also searched the proceedings of the International Conference on Business Process Management via SpringerLink (SL) and the BPM Journal, indexed in the Emerald database. For BPM, we used the keywords "business process management" or "BPM," which have been proven successful in previous reviews (vom Brocke & Sinnl, 2011). We based our keywords on Kraus et al. (2018) for digital

entrepreneurship. They used "digital entre*", "digital startup," as well as the combination of "digital innovation" AND "entre*". The resulting search term[1] was entered into the different databases.

Our initial search returned 987 papers, which we scanned by reading the abstracts. During the scanning process, we included papers connected to BPM and digital entrepreneurship, which we validated by checking if the terms or synonyms (e.g., "digital startup" for digital entrepreneurship) were explicitly mentioned. When we were unsure about the connection to BPM and digital entrepreneurship, we scanned the full text of the papers. Also, we removed duplicates. This way, we ended up with 90 papers that we took into the next stage of the review process. We then applied our inclusion criteria to review the 90 remaining papers' full text. To be included, papers had to be written in English and directly mention digital entrepreneurship or BPM in their full texts. To give an example, we included Tumbas et al. (2017b), who report on digital ventures and how they deal with episodes of rapid growth by leveraging digital technologies, which also affect their business processes. However, we excluded Secundo et al. (2021), who focus on entrepreneurship education, not on digital entrepreneurship per se. To ensure quality, we only included peer-reviewed papers published in academic outlets that are at least C-ranked in the German VHB-JOURQUAL3 ranking, leading to 42 papers. Furthermore, we included three papers through forward and four through backward search. Following this process, we identified 49 papers to analyze. To support the literature search process, we used the bibliography manager Zotero. Figure 1 illustrates the phases of our literature search process.

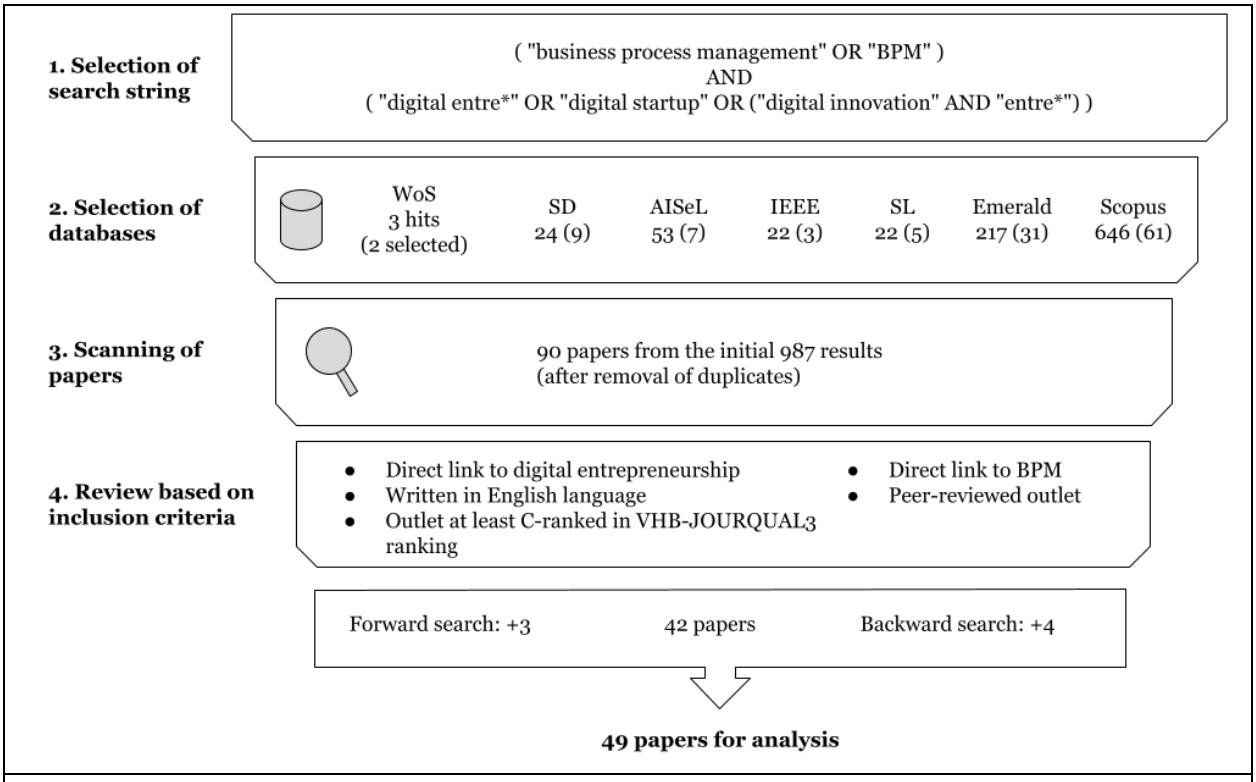

Figure 1. Literature Review Process

Data Analysis

We created an Excel sheet to analyze our paper sample and categorized the papers based on their research approach, methodology, applied theoretical lenses, research outcomes, and emerging themes. We used the software ATLAS.ti for an inductive qualitative data analysis to support this process. Vom Brocke et al. (2016) note that application areas of BPM are highly diverse, leading to the need to understand

[1] ((“business process management” OR “BPM”) AND (“digital entre*” OR “digital startup” OR (“digital innovation” AND “entre*”)))

requirements in newly emerging contexts. To analyze the current state of research on the role of BPM in the context of digital entrepreneurship, we build upon their framework to understand the related contextual factors. Therefore, we coded our data by searching for the use of theoretical lenses and for emerging themes in the four dimensions that vom Brocke et al. (2016) use to categorize their findings. These dimensions – (1) goals of BPM, (2) characteristics of the process, (3) specifics about the organization in which BPM is applied, and (4) the broader business environment in which BPM is embedded – were particularly relevant to our research question and provided a useful framework for our analysis. We carefully reviewed our data, searching for commonalities and patterns within each dimension. Table 1 provides examples of how we coded the emerging themes in our analysis for every dimension by vom Brocke et al. (2016). For example, in the environmental dimension, the authors describe factors outside the organization that affect the organization's BPM. Therefore, we coded text passages dealing with topics such as the high uncertainty faced by digital ventures and mapped them to this dimension. The coding was performed by the first author and reviewed in weekly meetings by the second author. For ease of understanding, we use the term digital venture in our text, even though the sample papers sometimes name the organizations they report on differently, such as "startups" (Flechas Chaparro & de Vasconcelos Gomes, 2021) or "small firms" (Chan & Ahuja, 2015).

Quote from literature	**Assigned code**	**Dimension**
"Rapid *entrepreneurial growth* is a phase in the organization's lifecycle at the transition between the "startup" phase and the more mature organizational form." (Tumbas et al., 2017b, p. 7)	Entrepreneurial growth	Goal
"[…] future studies interested in this area can investigate how to utilize information technology to *facilitate and improve the process of entrepreneurship itself*. Entrepreneurship is a journey which starts from a new creative idea and a whole process to convert the idea into a business." (Harb & Shang, 2022, p. 10)	Entrepreneurship is viewed as a process	Process
"The 'competitive war' in the new market scenario hence involves new ventures as well as larger organizations, and while new ventures may benefit from their *inherent flexibility*, they also have to cope with strong financial and resource constraints limiting their course of action." (Balocco et al., 2019, p. 1536)	Organizational flexibility	Organization
"Since a pivot decision occurs under *uncertainty*, entrepreneurs may find it difficult to determine the best strategy for a pivot – what, when and how to pivot – as well as determine what the consequences might be." (Flechas Chaparro & de Vasconcelos Gomes, 2021, p. 884)	High uncertainty	Environment

Table 1. Example Coding of Emerging Themes

Our 49 sample papers utilized various methods to explore various aspects of digital entrepreneurship. Qualitative methods, such as multi-case and single-case studies, were used in 23 papers to explore BPM and digital entrepreneurship in different contexts. Eighteen papers used literature reviews to provide an overview of existing research and identify gaps in the literature. Additionally, some papers applied topic modeling to identify and analyze trends and themes within large sets of textual data. Expert panels were also utilized to gather insights from industry experts and practitioners. Quantitative methods were used in six papers to analyze data from surveys and panel data analysis to explore the relationship between different variables in digital entrepreneurship. One paper is a journal guest editorial, while one follows a mixed methods approach. In the following, we italicize all papers from our SLR sample to explicitly highlight them.

Results: BPM in the Context of Digital Entrepreneurship

This section presents our study's findings that shed light on the current knowledge of the intersection of BPM and digital entrepreneurship. Our findings provide an overview of our paper sample's key theoretical lenses and predominant themes, which we later build on to discuss synergies and tensions.

Theoretical Lenses

Literature on BPM and digital entrepreneurship draws upon multiple theoretical perspectives to investigate the intersection of BPM and digital entrepreneurship. In our sample data, the predominant theoretical lens (eight of 49 papers) is the *dynamic capabilities* view. According to Teece (2007), dynamic capabilities can be classified as sensing, seizing, and transforming. Sensing refers to identifying opportunities and threads. Seizing refers to using opportunities and transforming means to maintain competitiveness by enhancing, combining, protecting, and, if necessary, re-configuring the available assets. We analyzed the articles based on which dynamic capability the authors refer to. For instance, *Goni & Van Looy (2022)* conducted a literature review and drew on dynamic capabilities to develop a framework for implementing process innovation capabilities for less structured business processes. In this context, they identify that people, processes, and technology are pillars of process innovations. Following Teece (2007), this approach can be classified as a framework for seizing opportunities. *Vrontis et al. (2022)* draw on resource-based view literature to develop a framework showing that adopting digital technologies impacts the creation of economic sustainability and social value for SMEs. *Santos & de Pádua (2022)* also applied dynamic capabilities in two case studies to develop a BPM promotion framework for startups. The authors propose a four-step framework for promoting BPM in startups, which involves developing objectives and understanding organizational culture, gaining a practical understanding of BPM and its application, enabling BPM by establishing organizational processes and continuing to apply BPM in other organizational situations to develop sensing, seizing, and transforming capabilities. *North et al. (2020)* propose a framework based on dynamic capabilities to promote digitally enabled growth in SMEs. It consists of four phases: sensing digitally enabled growth potentials, developing a digitally enabled growth strategy and mindset, seizing the potentials, and managing resources for digital transformation. With this framework, they cover sensing, seizing, and transforming capabilities (Teece, 2007). Also, *Tumbas et al. (2017b)* identify that digital capabilities can buffer the structural, temporal, and spatial tensions that digital ventures face when they grow rapidly. They find that a layered modular view of digital technologies, stepwise implementation, partial integration, and reuse of the content and service layers are enablers to address the tensions. Their approach focuses on the dynamic capability of transforming. Additionally, the authors expand upon *organizational ambidexterity* (March, 1991), as *Ahmad & Van Looy (2022)* demonstrated. They utilize ambidexterity and task-technology-fit theory to create a theory of process-technology fit. Through an expert panel and content analysis of 19 interviews, they provide evidence of ambidextrous BPM practices and shed light on the implications of process-technology fit (or lack thereof) for specific technologies.

Other theoretical lenses were only used in single papers. One example is the *affordance theory* going back to Gibson (1977). *Mero et al. (2022)* identify a startup's key processes to capitalize on Software-as-a-Service marketing automation software affordances. They analyze how organizations apply an agile implementation approach to continuously adapt features of a SaaS enterprise system and organizational routines for improving their fit regarding the organizational goals. A theoretical concept stemming from entrepreneurship literature is the lens of *entrepreneurial bricolage* (Baker & Nelson, 2005). *LeLoarne & Maalaoui (2015)* apply it by researching the evolution of business processes in high-tech companies. In a multiple case study, they find that entrepreneurs in such settings pursue trial-and-error approaches to create business processes. Furthermore, in a mixed-methods approach, *Van Looy (2021)* applied the *diffusion of innovation theory* to extend the *Technology-Organization-Environment (TOE) framework* to include a readiness matrix that profiles organizations based on their mastery of digital process innovation. Examples of other theoretical lenses in the data are *lean thinking (Balocco et al., 2019)*, *design space exploration (Gross et al., 2021)*, *strategic alignment (W. Li et al., 2016)*, *collective intelligence (Elia et al., 2020)*, and the *theory of mechanisms (Lehmann & Recker, 2022)*.

Emerging Themes

Vom Brocke et al. (2016) highlight the importance of context for BPM to work most effectively and efficiently. In their paper, they introduce four dimensions to investigate contextual factors of BPM. The four dimensions are (1) the *goals*, (2) *process characteristics*, (3) specifics about the *organization*, and (4) the broader business *environment* in which BPM is embedded. For our analysis, we view digital entrepreneurship as the broad context of BPM and use their four dimensions to cluster the themes we found in our data. Table 2 provides an overview of our findings in every dimension.

Dimension	Emerging themes (number of papers) (including example references)
Goal	**Entrepreneurial growth (20)** *(Elia et al., 2020; Goni & Van Looy, 2022; Lehmann & Recker, 2022; W. Li et al., 2016; North et al., 2020; Tumbas et al., 2015, 2017a, 2017b)* **Ambidextrous BPM (4)** *(Ahmad & Van Looy, 2022; Grisold et al., 2022; Rosemann, 2020; Van Looy, 2018)* **Digital innovation (22)** *(Ammirato et al., 2022; Goni & Van Looy, 2022; Hoch & Brad, 2021; Keller et al., 2022; W. Li et al., 2016; Satalkina & Steiner, 2020; Van Looy, 2018)*
Process	**Entrepreneurship is viewed as a process (5)** *(Corvello et al., 2022; Elia et al., 2020; Harb & Shang, 2021, 2022; Schiavone et al., 2022)* **Infrastructural flexibility (4)** *(Baiyere et al., 2020)* **Modularity (11)** *(H. Li & Kettinger, 2021; Tumbas et al., 2017b)* **Usage of enterprise-wide information systems (20)** *(Ha et al., 2018; Mero et al., 2022; Tumbas et al., 2017a)* **Architectural amplification & processual embedment (3)** *(Lehmann & Recker, 2022)* **Analyzing digital trace data (6)** *(Mendling et al., 2020; Tumbas et al., 2017a)*
Organization	**Organizational flexibility (42)** *(Baiyere et al., 2020; Balocco et al., 2019; Chan & Ahuja, 2015; Goni & Van Looy, 2022; Lehmann & Recker, 2022; LeLoarne & Maalaoui, 2015; Mendling et al., 2020; North et al., 2020; Santos & de Pádua, 2022; Tumbas et al., 2017a; Van Looy, 2018; Wardhana et al., 2022; Weiss & K. Kanbach, 2022; Zaheer et al., 2019)* **Qualification and upskilling of employees (30)** *(Corvello et al., 2022; Imgrund & Janiesch, 2019; Tumbas et al., 2017b)* **IT infrastructure alignment and business IT alignment (8)** *(Baiyere et al., 2020; Harb & Shang, 2021, 2022; W. Li et al., 2016; Salmela et al., 2022; Van Looy, 2021; Vecchi et al., 2021; Wang, 2018)* **Customer orientation (24)** *(Chan & Ahuja, 2015; da Costa et al., 2022; Gross et al., 2021; Hoch & Brad, 2021; Ivanov & Bernroider, 2022; LeLoarne & Maalaoui, 2015; Mariani & Fosso Wamba, 2020; North et al., 2020; Rosemann, 2020; Santos & de Pádua, 2022; Tumbas et al., 2017a)* **Stakeholder involvement (37)** *(Danilova, 2019; Flechas Chaparro & de Vasconcelos Gomes, 2021; Imgrund & Janiesch, 2019; LeLoarne & Maalaoui, 2015; Santos & de Pádua, 2022)*
Environment	**High uncertainty (28)** *(Ahmad & Van Looy, 2022; Balocco et al., 2019; da Costa et al., 2022; Flechas Chaparro & de Vasconcelos Gomes, 2021; Imgrund & Janiesch, 2019; Keller et al., 2022; Van Looy, 2018)* **Resource constraints (37)** *(Balocco et al., 2019; Tumbas et al., 2017b, 2017a; Van Looy, 2018)* **Ecosystems (24)** *(Elia et al., 2020; Hoch & Brad, 2021; H. Li & Kettinger, 2021; Satalkina & Steiner, 2020; Wang, 2018)*

Table 2. Dimensions and Emerging Themes

Goal dimension. Digital ventures strive for entrepreneurial growth *(Tumbas et al., 2017b)*. In our literature, it has been recognized that digital technologies have the potential to act as a key source of *entrepreneurial growth (W. Li et al., 2016)*. *North et al. (2020)* confirm this point by developing a framework to guide SMEs to sense and seize digital growth opportunities to remain competitive in turbulent environments. In our paper sample, an example lens used to uncover this theme is the concept of dynamic capabilities (*North et al., 2020)*.

Another emerging theme is ambidextrous BPM, building on the concept of organizational ambidexterity *(Ahmad & Van Looy, 2022; Grisold et al., 2022; Rosemann, 2020; Van Looy, 2018)*. Ambidextrous BPM describes balancing both explorative and exploitative business processes. Both entrepreneurship literature and BPM literature deal with this balance. During pivots, for instance, sometimes digital ventures are forced to explore and set up a new business model while the old one still performs *(Balocco et al., 2019)* —

furthermore, digital ventures balance structure and flexibility *(Tumbas et al., 2017b, 2017a)*. BPM is often identified as a main driver of organizational efficiency *(Imgrund & Janiesch, 2019)*. Hence, "classical" BPM focuses on responding to pain points to save costs and make processes faster and more compliant *(Mendling et al., 2020)*. In contrast, in the opportunity-rich digital era, *Rosemann (2020)* argues that this *exploitative* BPM is no longer enough, calling for an *explorative* approach to BPM that searches for opportunity points. In this regard, ambidextrous BPM should also consider exploration to support ventures' success *(Grisold et al., 2022)*.

Also, *digital innovation* emerges as a theme. In the literature, it is seen as a means for digital ventures' business model innovation and business process improvements *(Ammirato et al., 2022; Goni & Van Looy, 2022; Hoch & Brad, 2021; Keller et al., 2022; North et al., 2020; W. Li et al., 2016; Satalkina & Steiner, 2020; Van Looy, 2018)*. Authors dealing with this theme apply the lens of dynamic capabilities *(North et al., 2020*).

Process dimension. Some papers view *entrepreneurship itself as a process (Corvello et al., 2022; Elia et al., 2020; Harb & Shang, 2021, 2022; Schiavone et al., 2022)* that can be improved by applying information technology *(Harb & Shang, 2021, 2022)*. In parts of the sample data, the digital venturing process is described in phases *(Elia et al., 2020; Schiavone et al., 2022; Zaheer et al., 2019), such as prospecting, developing, and exploiting (Zaheer et al., 2019)*. While most papers on this theme do not explicitly state drawing from a theory, *Elia et al. (2020)* note that they use collective intelligence as a lens.

Also, the role of IT infrastructure is thematized. *Baiyere et al. (2020)* analyze how the logics of BPM change during digital transformation projects. While "traditional" BPM was based on the careful alignment of IT infrastructure and the processes it must support, they state that in the digital era, *infrastructural flexibility* is key to dealing with continuously changing requirements and markets *(Baiyere et al., 2020)*. They find that when "infrastructures are malleable and responsive to emergent business process needs, they can accommodate the generative nature of digital innovations" *(Baiyere et al., 2020, p. 253)*. Their argument is supported by *Tumbas et al. (2017b)*, stating that digital infrastructure provides the basis for digital innovation. As a theoretical lens, *Tumbas et al. (2017b)* draw on dynamic capabilities (Teece, 2007).

Furthermore, *business process modularity* is important since entrepreneurial organizations strive for more flexibility *(Tumbas et al., 2017b)*. This is backed by *W. Li et al. (2016)*, stating that "[m]odularising and interfacing IS infrastructure is important for leaders to ensure flexibility in delivering service and value" *(W. Li et al., 2016, p. 200)*. From a BPM perspective, modular business processes allow for more context-sensitivity and resulting local business process optimizations that were not possible when BPM is only viewed from a holistic enterprise-wide perspective *(Imgrund & Janiesch, 2019)*. A lens authors use on this theme is strategic alignment theory (*W. Li et al., 2016)*.

Additionally, several studies highlight *using enterprise-wide information systems* to support business processes *(Ha et al., 2018; Mero et al., 2022; Tumbas et al., 2017a)*. While *Ha et al. (2018)* state that enterprise IT can help firms to become more entrepreneurial, *Tumbas et al. (2017b)* point out that "classical" enterprise systems could potentially also become a "hindrance rather than fuel[ing] flexibility" *(Tumbas et al., 2017b, p. 13)*. Furthermore, they observed that startups often use simple tools like Microsoft Excel for project planning before they develop the need to move to professional, specialized solutions. In practice, we can observe that many enterprise systems are used in a Software-as-a-Service model *(Imgrund & Janiesch, 2019; Mero et al., 2022)*. A theoretical lens used to uncover this theme is affordance theory, for instance, used by *Mero et al. (2022)*.

Lehmann & Recker (2022) introduce the concept of *architectural amplification* to explain how digital ventures broaden their products' scopes by integrating their products into the offerings of third parties. More specifically, they state that digital ventures aim for *processual embedment*: "Processual embedment captures the activities by which digital ventures sought to complement their digital offerings by enabling it to fit into a broader variety of different business processes. Processual embedment requires a deep understanding of the environment in which offerings were meant to be situated in. The ventures viewed their offerings not in isolation but as existing within a larger digital value landscape" *(Lehmann & Recker, 2022, p. 81)*. For their analysis, the authors draw on the theory of mechanisms to analyze how digital technologies change entrepreneurial processes and outcomes.

Moreover, the literature suggests *analyzing digital trace data* of ventures to uncover the performed activities in enterprise-wide information systems. Digital trace data analysis and process mining are

powerful techniques for analyzing and improving business processes *(Mendling et al., 2020; Tumbas et al., 2017b)*. Digital trace data analysis involves collecting and analyzing data generated by users' digital interactions with an organization's systems and applications. Process mining involves using this data to map and analyze the organization's business processes, identifying bottlenecks, inefficiencies, and areas for improvement. These techniques allow organizations to gain deep insights into their operations, optimize their processes, and ultimately increase efficiency and effectiveness. By using digital trace data analysis and process mining, businesses can make data-driven decisions and continuously improve their operations to stay competitive in a rapidly changing digital landscape.

Organization dimension. *Organizational flexibility* is a frequent theme in our data *(Goni & Van Looy, 2022; Lehmann & Recker, 2022; Mendling et al., 2020)*. Regarding the organizational development of digital ventures when growing, *Tumbas et al. (2017b)* highlight that digital ventures have to create structures in their organization while maintaining parts of their inherent flexibility. *Balocco et al. (2019)*, for instance, state that new ventures may benefit from their flexibility. Even though digital ventures must build functional specializations when growing, they seek to avoid rigidity and bureaucratic processes *(Tumbas et al., 2017b)*. In this context, agility is also presented as an important factor for the success of BPM and digital ventures *(Ganguly et al., 2022; Imgrund & Janiesch, 2019; W. Li et al., 2016; Mero et al., 2022; Salmela et al., 2022; Steininger, 2018; Van Looy, 2018, 2021)*. To uncover this theme, among others, authors again draw on the lens of dynamic capabilities (Teece, 2007) (*Tumbas, 2017b)*.

Qualification and upskilling of employees is another emergent theme. *Tumbas et al. (2017b)* note that roles in digital ventures that grow rapidly shift from a general skill set to a more specialized one. This is aligned with *Imgrund & Janiesch (2019)*, stating that organizations in the digital era should add BPM roles, such as process owners, to their organizations. Other papers from the entrepreneurship domain underline this finding *(Corvello et al., 2022)*. This theme also emerged through, among other things, building on dynamic capabilities *(Tumbas, 2017b)*.

The intersection of technology and organization has given rise to several key themes, such as *IT infrastructure alignment and business IT alignment (Baiyere et al., 2020; Harb & Shang, 2021, 2022; W. Li et al., 2016; Salmela et al., 2022; Van Looy, 2021; Vecchi et al., 2021; Wang, 2018)*. These themes highlight the critical importance of aligning an organization's technology and business strategies to ensure they are mutually supportive and in sync. Organizations can increase efficiency, reduce costs, and improve overall performance by aligning their IT infrastructure and business goals. Hence, it is essential to consider IT infrastructure and business IT alignment as key elements in the strategy development and implementation process. For example, *Van Looy (2021)* used the diffusion of innovation theory as a lens.

Customer orientation is a key driver of success for both digital entrepreneurship and BPM initiatives as it ensures that organizational strategies and processes are aligned with customer needs and preferences *(Chan & Ahuja, 2015; da Costa et al., 2022; Gross et al., 2021; Hoch & Brad, 2021; Ivanov & Bernroider, 2022; LeLoarne & Maalaoui, 2015; Mariani & Fosso Wamba, 2020; North et al., 2020; Rosemann, 2020; Santos & de Pádua, 2022; Tumbas et al., 2017a)*. In a customer-centric approach, the emphasis is on understanding the customer's pain points and delivering value through innovative and agile processes that can adapt quickly to changing customer requirements. Businesses can improve customer satisfaction and gain a competitive advantage in the marketplace by placing the customer at the center of their operations. Therefore, customer orientation is critical for digital ventures to survive and thrive in today's dynamic business environment *(da Costa et al., 2022)*. Entrepreneurial bricolage has been used as a theoretical lens by authors elaborating on customer orientation *(LeLoarne & Maalaoui, 2015)*.

This goes hand in hand with the *involvement of other critical stakeholders,* which is crucial for the success of BPM initiatives and digital entrepreneurship *(Danilova, 2019; Flechas Chaparro & de Vasconcelos Gomes, 2021; Imgrund & Janiesch, 2019; LeLoarne & Maalaoui, 2015; Santos & de Pádua, 2022)*. Stakeholders such as employees, suppliers, and partners can provide valuable insights into the target audience's needs, expectations, and preferences. Their active participation in the BPM process can help identify potential bottlenecks and opportunities for improvement. Moreover, engaging with stakeholders can help build trust and foster a sense of ownership, leading to increased commitment and motivation to achieve common goals. Therefore, organizations must involve critical stakeholders in their BPM to ensure its long-term success. Furthermore, ventures should actively engage in boundary management to strengthen collaboration with their environment *(Caputo et al., 2019)*.

Environment dimension. The sample papers describe the environment of entrepreneurs as characterized by *high uncertainty (Ahmad & Van Looy, 2022; Balocco et al., 2019; da Costa et al., 2022; Flechas Chaparro & de Vasconcelos Gomes, 2021; Imgrund & Janiesch, 2019; Keller et al., 2022; Van Looy, 2018; vom Brocke et al., 2016)*. This fact makes it hard for entrepreneurs to make informed decisions. High uncertainty forces digital ventures to be more flexible to outperform competitors *(da Costa et al., 2022)*. By dealing with this theme, *Balocco et al. (2019*), for instance, build on the lens of lean thinking.

Additionally, the high uncertainty of digital entrepreneurs is often coupled with *resource constraints,* creating additional organizational challenges *(Balocco et al., 2019; Tumbas et al., 2017b, 2017a; Van Looy, 2018)*. The constraints include a lack of time, money, or workforce compared to incumbent firms, limiting ventures' course of action. Research highlighting entrepreneurs' resource constraints builds on dynamic capabilities (*Tumbas et al., 2017b*).

Furthermore, the role of *ecosystems* is highlighted in the literature *(Elia et al., 2020; Hoch & Brad, 2021; H. Li & Kettinger, 2021; Satalkina & Steiner, 2020; Wang, 2018)*. For instance, *Elia et al. (2020)* analyze digital entrepreneurship ecosystems' activities, actors, motivations, and organizations and their influence on entrepreneurial processes. In addition, *Wang (2018)* argues for multi-level modeling of digital innovation landscapes from an ecological perspective.

Discussion

BPM's role in supporting digital ventures is crucial as they grow and evolve. However, tensions and synergies exist between BPM and digital entrepreneurship literature. Below, we describe these tensions and synergies and suggest avenues for future research.

Tensions

The first tension we identified is between the *structure* of exploiting BPM and the inherent *flexibility* of digital ventures. *Baiyere et al. (2020)* describe modeling (process logic), infrastructural alignment (infrastructure logic), and procedural task performance (agential logic) as dominant logics of traditional BPM. These logics reflect the underlying assumption that business processes are first designed and then executed *(Mendling et al., 2020)*. These traditional logics contrast with the flexibility of digital ventures *(Tumbas et al., 2017b)*. The high uncertainty of the venturing process makes it hard to invest in fixed processes that might be subject to change at any time when the business model or external factors change. Hence, it seems that traditional BPM logics are not fit for digital ventures that are often unstable enough for fixed process designs. In their article, *Baiyere et al. (2020)* analyze how the mentioned logics change when organizations enter digital transformations. They describe light touch processes (process), infrastructural flexibility (infrastructure), and mindful actors (agency) as new BPM logics. They stress that in digital transformations, business processes are not stable, efficient, and well-organized but rather reliant on flexibility and rational actors. These new logics may also apply to digital venture business processes. In the process dimension, also the use of enterprise systems holds tension. We see different opinions in the literature. *Ha et al. (2018)* find enterprise IT can help firms become more entrepreneurial, while *Tumbas et al. (2017b)* point out that "classical" enterprise systems could become a hindrance. Future research should try to find out which turns out correct for digital ventures and what unique requirements they have for enterprise systems.

Another tension is the *skill set of actors* in business processes. BPM scholars assume that the delegation of tasks and the existence of process owners guide business processes *(Danilova, 2019; Van Looy, 2018)*. Digital ventures before the early stages of growth, however, rather work with people with a generalist skill set that needs to change when ventures grow *(Tumbas et al., 2017b)*. To establish successful business processes in digital ventures, this tension in the skill set of employees in digital ventures must be managed.

Synergies

On the other hand, our literature review unveiled several synergies between BPM and digital entrepreneurship that scholars could use to advance both research areas.

If *digital venturing can be seen as a process (Corvello et al., 2022; Elia et al., 2020; Harb & Shang, 2022; Schiavone et al., 2022)*, it is reasonable to assume that we can apply BPM methods to improve it. Using approaches such as process mining or other forms of trace data analysis, digital entrepreneurs could better understand their processes and use the generated insights to inform decisions. Since digital venturing, however, is highly dynamic, the application of process mining should also be used dynamically. According to *Mendling et al. (2020)*, applications should aim to find stable patterns and uncover room for process deviances.

Both BPM and digital entrepreneurship literature highlight the use of *digital technologies*. Papers on BPM stress the importance of business IT alignment *(Baiyere et al., 2020; Harb & Shang, 2021, 2022; W. Li et al., 2016; Salmela et al., 2022; Van Looy, 2021; Vecchi et al., 2021; Wang, 2018)*. Papers on digital entrepreneurship emphasize the importance of digital technologies for the venturing process *(Lehmann & Recker, 2022; Tumbas et al., 2015, 2017a, 2017b)*. Finding suitable digital tools, however, remains a challenge since guidance for entrepreneurs is scarce. However, viewing digital entrepreneurship as a process might help since theoretical concepts such as a process-technology-fit have been developed *(Ahmad & Van Looy, 2022)*. Furthermore, the call for more process modularity is an aspect that BPM and digital entrepreneurship literature share. To overcome tensions when they formalize, *Tumbas et al. (2017b)* find that digital ventures "seek to modularize their process which allows for flexibility" *(Tumbas et al., 2017b, p. 14)*. In this regard, modular business processes can not only support the operations of digital ventures but also may support the design of software platforms. *H. Li & Kettinger (2021)* recommend taking a business process management perspective and investigating "how organizations can utilize software platforms to design and reengineer their business processes. For example, can organizations develop the layered modularity of business processes to decompose business processes and facilitate process recombination possibilities?" *(H. Li & Kettinger, 2021, p. 1538)*.

Our sample also shows that both BPM and digital entrepreneurship strive for *ambidexterity*. *Grisold et al. (2022)*, for instance, describe ambidextrous BPM as a way to balance exploitative and explorative BPM activities. *Tumbas et al. (2017b)* underline this finding and state that digital ventures must persist in their organizational design while performing changes to facilitate entrepreneurial growth.

Another synergy between business process management and digital entrepreneurship is the *customer orientation* that the literature highlights. *Caputo et al. (2019)* stress boundary management's importance in serving customers. Furthermore, *da Costa et al. (2022)* point out that ventures have to follow customer preferences. However, the processual embedment of digital venture products *(Lehmann & Recker, 2022)* poses a chance for digital ventures to leverage BPM knowledge to integrate their offerings into the business processes of third parties to generate value for customers.

Furthermore, our sample highlights that *agility* is an important concept in papers dealing with BPM or digital entrepreneurship. According to the literature, both BPM initiatives and digital ventures seem to benefit from it. *Mendling et al. (2020)*, for instance, say that "approaches for managing business processes must learn from digital innovation methodologies" *(Mendling et al., 2020, p. 213)* and, thus, become more agile. *Steininger (2018)* states that "ventures often achieve high IT alignment through their agility, and high alignment [leads] to higher performance by the ventures" *(Steininger, 2018, p. 372)*. Hence, a high level of agility should characterize both BPM initiatives and organizations.

Research Agenda

Having reviewed the literature and identified the key lenses, themes, synergies, and tensions, we derive a research agenda for guiding future studies exploring the intersection of BPM and digital entrepreneurship. Figure 2 shows our process. The arrows represent how the themes lead to synergies and tensions, which are then addressed in our three research avenues.

This section outlines research questions and objectives to drive investigations into their relationship. Doing so sets the stage for future studies to build on existing knowledge and contribute to our understanding of BPM's role in digital entrepreneurship. Our goal is to create a path to realize BPM's potential to improve the digital venturing process. Table 3 offers an overview of future research avenues and example research questions.

Theme 1: Ambidextrous Business Process Management in Digital Ventures

Both literature on digital entrepreneurship and BPM are interested in the concept of ambidexterity (March, 1991). To draw from this synergy, one research avenue is the application of ambidextrous BPM in digital ventures, which could reveal insights into how organizations can effectively manage both exploratory and exploitative activities within their business processes.

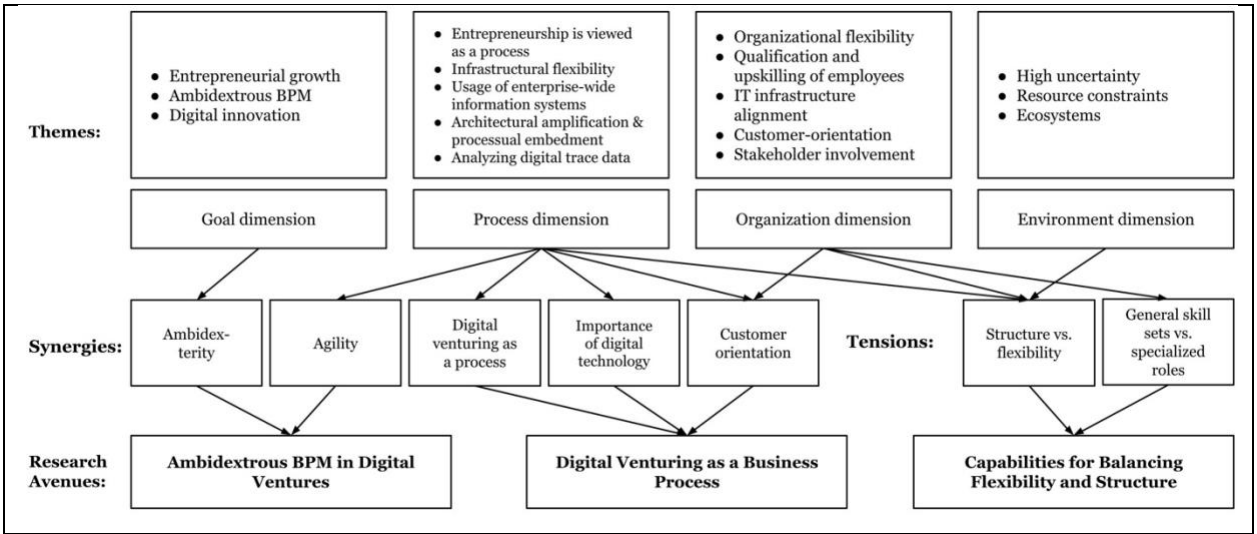

Figure 2. Derivation of Research Avenues

With this, future researchers could contribute to the call by *Rosemann (2020)*, stating that *exploitative* BPM is no longer enough in the digital era and that an *explorative* approach to BPM searching for opportunity points is needed. New insights into ambidextrous BPM in digital ventures could guide entrepreneurs looking to balance innovation and efficiency in the increasingly competitive digital landscape. In addition, future research could focus on how entrepreneurs can achieve the right balance between exploring and exploiting business processes, which is key to achieving sustainable growth, as exploration allows for innovation and growth, while exploitation ensures efficiency and stability. *Balocco et al. (2019)* address business model changes in digital ventures, which is a significant practical challenge. Another aspect that warrants investigation is the support of business model pivots with BPM methods. Business model pivots are common in the startup world, where market conditions can change rapidly, and entrepreneurs lack resources and face high uncertainty. BPM can support these pivots by enabling companies to quickly adapt their business processes to align with the new business model. These insights could help digital ventures stay competitive in a constantly evolving market. Finally, it would be interesting to investigate how ambidextrous BPM can be applied in digital ventures to identify new growth opportunities while optimizing existing processes for efficiency.

Theme 2: Digital Venturing as a Business Process

A possible research avenue to draw from the synergies of BPM and digital entrepreneurship is investigating digital venturing as a business process itself. This view poses the potential to apply BPM methods to improve the digital venturing process to optimize efficiency and effectiveness. Work in this research avenue could contribute to following the call of *Harb & Shang (2022)* to not only use digital technologies to improve a venture's business model but also the "entire journey of converting the business idea into an enterprise" *(Harb & Shang, 2022, p. 10)*.

Most papers in the sample followed a qualitative research approach. Thus, trace data analysis or process mining can be applied to enhance our understanding of entrepreneurs' activities in the digital venturing process. Possible data sources are event logs from enterprise-wide information systems like ERP systems, data from messaging apps like Slack, or protocols from project management systems such as Trello. Trace data analysis can reveal patterns and insights into the decision-making and actions of entrepreneurs during the digital venturing process, which can then be used to inform process improvements and optimization.

Future research avenues	Example research questions
Theme 1: Ambidextrous BPM in digital ventures	• How can ambidextrous BPM be effectively applied in digital ventures while growing? • How can ambidextrous BPM support digital ventures during pivots? • How can ambidextrous BPM support digital ventures to react to changing market requirements?
Theme 2: Digital venturing as a business process	• How can BPM methods help digital ventures embed their offerings into the business processes of third parties and customers? • How can digital trace data analysis and process mining be used to gain insights into the decision-making and actions of entrepreneurs during the digital venturing process, and how can these insights be used to improve the process? • How can we understand the evolution of business processes in digital ventures by applying process mining? • What are the requirements for developing enterprise systems tailored to the needs of digital ventures, and how can these systems be effectively integrated into the digital venturing process?
Theme 3: Capabilities for balancing flexibility and structure	• How are digital ventures balancing structure and flexibility in their business processes? • How can we train and prepare employees to scale digital venture business processes? • What are the key success factors for developing scalable business processes in digital ventures, and how can these processes be effectively managed as the venture grows and expands? • How can modularization of business processes create more flexibility in digital ventures?

Table 3. Research Avenues and Example Research Questions

Through computationally intensive theory construction (Miranda et al., 2022), analyzing trace data from digital ventures could also provide valuable new theories to understand how ventures scale by applying BPM. Additionally, we suggest that future research analyzes how BPM methods can help digital ventures improve their customer orientation by embedding their offerings into the business processes of third parties (such as enterprise systems or digital platforms) and customers (*Lehmann & Recker, 2022)*. A deep understanding of customer and partner processes could allow ventures to expand their user base by offering customized solutions that increase their value-creation potential. Moreover, we suggest that future research considers the development of enterprise systems tailored to the specific needs of digital ventures. These systems can provide the flexibility and scalability required to meet the unique challenges of digital ventures, including rapid growth, shifting market conditions, and dynamic customer needs. Following the development of BPM and cloud computing, one possible model to implement such systems could be to provide business processes in a Business-Processes-as-a-Service (BPaaS) manner. According to Accorsi (2011), BPaaS is a special SaaS provision model in which cloud providers offer methods for the modeling, utilization, customization, and (distributed) execution of business processes. As digital ventures operate under resource restrictions and high uncertainty, the execution of business processes in a BPaaS model could pose several benefits for digital ventures, such as reduced total cost of ownership compared to traditional enterprise systems, faster implementation of automated business processes, and faster changes and higher flexibility of business processes (Gzik, 2020).

Understanding the requirements for developing such systems is critical to their success. Deriving requirements demands an in-depth understanding of the needs and challenges faced by digital ventures and the technological capabilities required to address them. By focusing on these requirements, researchers can help to ensure that digital ventures have access to the tools and technologies they need to succeed in today's rapidly evolving digital landscape.

Theme 3: Capabilities for Balancing Flexibility and Structure

The inherent flexibility of digital ventures contrasts with the structure that comes with BPM. A critical challenge of digital ventures is to balance the rising tension over the stages of the digital venturing process. While some flexibility is needed to respond quickly to changing market requirements, the structure is needed to ensure consistent outcomes and become more efficient. Therefore, understanding which capabilities digital ventures need to balance flexibility and structure over time is a promising research avenue. Findings in that regard could lead to developing new frameworks and approaches to support entrepreneurs in successfully creating and growing digital ventures. The lens of dynamic capabilities (Teece, 2007) might be a useful starting point to analyze how ventures re-configure their resources for this task.

Tumbas et al. (2017b) discussed tensions in growing digital ventures and how digital capabilities can help to buffer them. Building on their findings, we propose to conduct more research by adding the analysis of digital trace data. Existing empirical research has focused on qualitative data; however, applying quantitative data analysis combined with qualitative insights might further enhance our understanding of the activities of digital ventures to overcome the tensions between structure and flexibility. Furthermore, developing scalable business processes is also critical for the success of digital ventures. As digital ventures grow, they must be able to adapt and scale their processes to meet their customers' changing needs. Our literature sample shows that it is important to focus on dynamic capabilities to sense opportunities, seize them, and transform existing resources. In this tradition, future research could investigate how digital ventures build up dynamic capabilities to deal with the evolution of business processes over their development stages. Furthermore, as digital ventures become more specialized and complex, it is important to educate employees on how to work effectively in new, more specialized roles. Early employees who might be used to working with a generalist skill set on a wide range of tasks must switch to more specialized roles that come with business processes. Investigating this phenomenon might provide further insights into the tension that digital ventures face when creating business processes on an employee level. In practice, these insights might help to provide specialized training to support employees in developing the skills and knowledge required to excel in their new roles.

Conclusion and Limitations

Returning to our initial research question, we analyzed the role of BPM in the context of digital entrepreneurship by analyzing the theoretical lenses, their use, and the emerging themes in the literature at the intersection of these two fields. As a result, we identify tensions and synergies. Furthermore, we derive avenues for future research: ambidextrous BPM in digital ventures, digital venturing as a business process, and capabilities for balancing flexibility and structure.

However, our results, by nature, are subject to limitations. First, it is important to note that we focused only on BPM. Our interest in BPM in the context of digital entrepreneurship was sparked by the idea of improving the process of digital venturing. Since BPM's objective is the improvement of processes *(Mendling et al., 2020)*, we wanted to analyze what role BPM can play in improving the process of turning ideas into businesses *(Harb & Shang, 2022)*. However, this view does not cover the whole picture of how processes emerge in digital ventures since BPM is seen as a largely prescriptive way to structure activities *(Mendling et al., 2020)*. Therefore, future work should also consider research on organizational routines (Becker, 2004; Feldman & Pentland, 2003). Second, since in the literature on the intersection of BPM and digital entrepreneurship, a joint set of terms has not yet emerged, there is some ambiguity with the term digital ventures as it refers to very young firms and more established ones. Third, we are aware of the ongoing debate on whether digital entrepreneurship offers anything new to the entrepreneurship discourse (Baiyere et al., 2023). However, we agree with Steininger et al. (2022), arguing that new entrepreneurship actors, changes to the development and innovation processes, new technologies and business models, and policy and regulation offer interesting changes that are worthwhile investigating. Nevertheless, we see our identified avenues for future research as a step forward in advancing our understanding of BPM in digital entrepreneurship. Finally, the themes we identified do not consider different maturity levels of digital ventures. In our future work, we will investigate if and how the role of BPM in digital ventures changes at different maturity levels. In doing so, we hope to contribute to the avenue of digital venturing as a business process. Specifically, we want to analyze why and how processes change in digital ventures by analyzing digital trace data in combination with qualitative interviews.

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