Thinking Outside of the IT Capability Box

Completed Research

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Abstract

The advent of digital technologies has initiated a new era of organizational transformation: the era of digital transformation. In this era, similar to the emergence of new strategies, new management roles, or new organizational cultures firms need to develop novel capabilities that allow them to pursue digital innovation. Against this backdrop, the information technology capability (ITC) construct has been continuously refined and extended over the last years. However, the question remains if ITC sufficiently addresses the specific challenges of digital innovation. Therefore, based on the pertinent ITC literature and state-of-the-art theories on digital innovation, we present an advancement of the ITC construct that accounts for the idiosyncrasies of digital innovation. Moreover, we argue that while research and practice still benefit from further advancements of the ITC construct, at the same time, future IS research should think outside of the ITC box and investigate dedicated digital capability concepts.

Keywords

Digital transformation, digital innovation, information technology, digital technology, IT capability, digital capability

Introduction

The advent of digital technologies has initiated a new era of organizational transformation (Yoo et al. 2012): the era of digital transformation. In this era firms have to master the transformative impact of innovative information systems (IS) and digital technologies (Lucas et al. 2013) on their products, processes, and business models (Fichman et al. 2014; Nambisan et al. 2017). The success stories of born-digital firms like Facebook, Google, or Amazon (Tumbas et al. 2017a), but also the struggles of traditional industries (e.g., Kodak’s bankruptcy) (Lucas and Goh 2009), stand testament for this notion. As a consequence, firms need to adopt, adapt, develop, and manage innovative IS and undergo a process of organizational transformation. This process is also referred to as digital transformation (Matt et al. 2015).

However, while digital transformation surely offers lucrative new business opportunities, it also induces significant changes within an organization (Nambisan et al. 2017). Firms have to deal with the emergence of new strategies (Bharadwaj et al. 2013; Hess et al. 2016), new management roles (Singh and Hess 2017; Tumbas et al. 2017c), or new organizational cultures (Piccinini et al. 2015). In the same spirit, increasingly digital business environments also require the development of novel, oftentimes digital capabilities (Chan and Ahuja 2015; Tumbas et al. 2017b). One important capability in this context is a firm’s capability for digital innovation (Lyytinen et al. 2016).

Research on digital innovation has gained momentum over the last years (Kohli and Melville 2018; Nambisan et al. 2017). However, so far we do not know enough on the capabilities that underlie digital innovation. Extant research has shown that firms need sufficiently advanced information technology capability (ITC) if they want to be successful digital innovators (Fichman et al. 2014; Mauerhoefer et al. 2017; Nwankpa and Datta 2017). Accordingly, IS research can help organizations deal with the emerging question of which capabilities are necessary for digital innovation success through the refinement of the ITC construct. At the same time, however, recent research has accentuated the idiosyncrasies of digital innovation and argued for novel theories on digital innovation management (Nambisan et al. 2017; Yoo et al. 2012). Accordingly, similar to dedicated digital management roles (Tumbas et al. 2017c) or digital strategies (Bharadwaj et al. 2013), digital innovation may also require dedicated digital capabilities.
Besides ITC. With our study we address this obscurity by investigating the role of ITC in the context of digital innovation. Hence, we raise the following research question:

*Should, in the context of digital innovation, IS research either focus on the refinement of the ITC construct, or allocate effort on the development of novel, dedicated digital capability constructs?*

Therefore, extending existing theory on digital technologies and digital innovation, we develop a technology-centered model of digital innovation. Then, based on a review of the pertinent literature, we analyze and synthesize existing research on the ITC construct and discuss it in the context of innovation in general and digital innovation in particular. In the following, we suggest an advancement of the ITC construct that accounts for the idiosyncrasies of digital innovation. Finally, since digital innovation depicts a central element of the organizational transformation induced by digital technologies, we generalize our findings to the broader context of digital transformation and give general directions for future research on IT-based capabilities. This way, we carry forward the spirit of Chan and Levallet (2013) who asked “IT Capabilities – Quo Vadis?” and set a baseline for future research.

The remainder of this paper is structured as follows: first, we introduce the theoretical foundation for this research. Then, we present our model of digital innovation. Thereafter, we give a summary of the existing literature on the ITC construct. After that, we present an advancement of the ITC construct that accounts for the idiosyncrasies of digital innovation. Then, we summarize our findings and discuss promising avenues for future research. Finally, we address the implications and limitations of our study.

**Theoretical Foundation**

**Resource-Based View and Organizational Capabilities**

IS research has acknowledged the resource-based view of the firm (RBV) as a central theory that helps explain how organizations achieve and sustain competitive advantage and superior performance. According to the RBV, superior performance is based on resources and capabilities that are firm-specific, rate, and hard to copy by competitors (Grant 1991). Hence, firms that want to achieve and sustain a position of superior performance need to acquire or develop firm-specific capabilities that are hard to imitate, rare, non-substitutable and non-imitatable (Bharadwaj 2000; Grant 1991). Such organizational capabilities vary across different firms and, thus, are the primary determinants of inter-firm performance differences. In general, organizational capabilities can be defined as an organization’s ability to organize its resources effectively to achieve strategic goals and optimize corporate performance (Grant 1991).

Over the last two decades, ITC has been recognized as a key organizational capability (Wade and Hulland 2004) and an important source for superior performance (Bharadwaj 2000). In line with RBV theory, firms can build up a competitive advantage based on ITC. However, so far there has been no clear answer to the question if ITC either directly impacts firm performance or leverages the value contribution of other resources and capabilities within a firm and, thus, indirectly impacts performance (Melville et al. 2004; Ravichandran and Lertwongsatien 2005). In this study, we assume an ambiguous view on this business value of IT phenomenon but argue that ITC, either directly or indirectly, determines firm performance.

**Organizational Change in the Era of Digital Technologies**

Over the last two decades the advent of digital technologies (i.e., combinations of information, computing, communication, and connectivity technologies) has fundamentally changed the way organizations do business (Bharadwaj et al. 2013). Principally, three fundamental properties of digital technologies can be made responsible for their transformative impact: reprogrammability, connectivity, and fast pace. Reprogrammability is a consequence of the von Neumann computing architecture and the stored-program concept that characterizes digital technologies (Yoo et al. 2010). It allows organizations to reprogram (or update) existing products and processes that are based on digital technologies. Ultimately, this leads to more flexibility and functionalities inherent to digital technologies. Connectivity refers to the fact that all digital data appears in binary format (i.e., bits of 1 and 0). Such a homogeneous data format allows a more loose coupling of the data itself and the processing device (Yoo et al. 2010) than analog data. This leads to the compatibility of various different data sources and processing devices which characterizes digital solutions (e.g., the internet-of-things) and the separation of medium from content and form from function (Lyytinen et al. 2016). Fast pace captures the rapid, often exponential way in
which digital technologies progress (e.g., in terms of computational power or data storage) (Fichman et al. 2014). This leads to a swift increase of the range of what it is technically and economically feasible.

The increasing prevalence of digital technologies has two different effects on organizations: digitalization and digital transformation. Digitalization, on the one hand, concerns the adoption, adaption, development, and management of innovative digital technologies within organizations. This involves the process of digitization which refers to the transformation of primarily physical or analog products, services or processes into primarily digital ones (Fichman et al. 2014; Legner et al. 2017; Yoo et al. 2010). Digital transformation, on the other hand, describes the organizational change induced by digital technologies (Legner et al. 2017). This can relate to products (Lyttinen et al. 2016), processes (Fichman et al. 2014), or business models (Nambisan et al. 2017) and heavily affect strategies (Bharadwaj et al. 2013), infrastructures (Henfridsson and Bygstad 2013) or governance structures (Svahn et al. 2017).

**A Technology-Centered Model of Digital Innovation**

An essential element of the organizational transformation induced by digital technologies (i.e., of digital transformation) is digital innovation. Digital innovation concerns the development and implementation of novel organizational solutions that are based on “new combinations of digital and physical components” (Yoo et al. 2010, p. 725) and can be understood as “the creation of market offerings, business processes, or models that result from the use of digital technology” (Nambisan et al. 2017, p. 224). Accordingly, the characteristic element of digital innovation is the use of innovative digital technologies in novel ways. Generally, IS research distinguishes two dimensions of digital innovation: (1) the digitalization of the innovation process, and (2) the digitalization of the innovation outcome. The digitalization of the innovation process, on the one side, concerns the use of digital technologies during the innovation process (Nambisan et al. 2017; Yoo et al. 2012). The digitalization of the innovation outcome, on the other side, captures the phenomenon that digital technologies depict an essential part of the innovation outcome (Kohli and Melville 2018; Nambisan et al. 2017) – for instance, digital products or services. Organizations have to leverage both dimensions if they want to exploit the potential offered from digital innovation.

Conceptually, digital innovation can be distinguished into three basic building blocks: (1) innovative digital technologies, (2) innovative digital solutions, and (3) innovative digital business concepts. Innovative digital technologies depict the starting point of digital innovation. Based on abstract digital technologies organizations have to develop specific innovative digital solutions and integrate them in their information technology (IT) landscapes. This process includes the adoption, adaption, or development as well as the management of digital technologies. Accordingly, the transition from an abstract digital technology to a concrete digital solution characterizes an organization’s digitalization. Innovative digital solutions, in turn, lead to the development of innovative digital business concepts that complement digital solutions. This transition from digital solutions to digital business concepts is also referred to as digital transformation and captures the organizational change induced by digital technologies. Figure 1 depicts this technology-centered perspective on digital innovation.

**Figure 1. Technology-centered Model of Digital Innovation**
Compared to other non-digital classes of innovation, digital innovation is idiosyncratic in several ways. To begin with, digital innovation does not follow a linear evolutionary process but unfolds in a non-linear, iterative way (Nambisan et al. 2017). Moreover, digital innovation requires a strong integration of the business and IT organization. Moreover, digital technologies lead to the democratization of innovation processes (Fichman et al. 2014) as well as a tendency towards more distributed innovation (Lyytinen et al. 2016) and open innovation systems (Saldaña et al. 2017). In addition, digital technologies increase the variety and flexibility but also the complexity of innovation (Nambisan et al. 2017; Yoo et al. 2010).

**Review of the IT Capability Literature**

Extending the RBV into the context of digital innovation demands that organizations that want to meet the opportunities and challenges resulting from digital technologies have to groom particular organizational capabilities that let them generate value based on digital technologies (Grant 1991). From an IS point of view, it seems logical that a firm’s capacity to manage its IT-based resources (or differently put: a firm’s ITC) plays an important role in this context.

To gain a better understanding of the role of ITC in the context of digital innovation, we take a closer look at the ITC construct. The following section is based on the pertinent literature in the IS research discipline on ITC. As a starting point and valuable reference, we relied on Chan and Levallet (2013) who scanned over 1,300 articles on ITC since 1990 and, thus, provide a valuable syntheses of the ITC literature. To account for recent advancements and to mirror the scope of this research, we also looked at IS research since the publication of Chan and Levallet (2013) and further impactful studies from related research disciplines such as innovation management, strategic management or organizational science.

In 2013, Chan and Levallet asked “IT Capabilities – Quo Vadis?” Over the last two decades the ITC construct has come a long way and witnessed various refinements to account for recent developments. However, its core has remained unchanged. In general, ITC allows organizations to acquire, deploy, combine, and reconfigure IT resources in order to support and enhance business processes and strategies (Sambamurthy and Zmud 1997). If firms want to create value from IT-based resources they need to develop a firm-wide ITC that allows them to use IT-based resources in order to leverage other firm-specific resources (Bharadwaj 2000; Ravichandran and Lertwongsatien 2005; Wade and Hulland 2004). Many studies, especially in the domain of IS research, refer to Bharadwaj et al. (1999)’s seminal article on the empirical measurement of ITC as the cornerstone for later following ITC conceptualizations and measurements. Bharadwaj et al. (1999) treat ITC as a second-order construct with six dimensions: IT infrastructure, IT business partnerships, business IT strategic thinking, IT business process integration, IT management, and external IT linkage (table 1). Such a multidimensional ITC construct provides a holistic view of the ITC that reflects the commonalities and synergies between various IT assets and resources within an organization (Bharadwaj 2000; Lu and Ramamurthy 2011; Mata et al. 1995). Up to this day, Bharadwaj et al. (1999)’s measurement of ITC has kept its validity and still provides the basis for various research projects including ITC (Chen et al. 2014; Nwankpa and Datta 2017; Zhang et al. 2013).

<table>
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<tr>
<th>IT capability dimension</th>
<th>Definition</th>
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<tbody>
<tr>
<td>IT business partnerships</td>
<td>Ability to foster rich partnerships between the technology providers (IT professionals) and technology users (business unit managers).</td>
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<tr>
<td>External IT linkages</td>
<td>Ability to leverage technology based linkages between the firm and its key business partners.</td>
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<tr>
<td>Business IT strategic thinking</td>
<td>Ability of management to envision how IT contributes to business value and the ability to integrate IT planning with the firm’s business strategies</td>
</tr>
<tr>
<td>IT business process integration</td>
<td>Ability to adapt existing business and IT work processes to continually enhance their effectiveness and efficiency as well as to leverage the capabilities of emerging information technologies</td>
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<tr>
<td>IT management</td>
<td>Ability to manage the IT function (i.e., IS planning and design, IS applications delivery, IT project management, and planning for IT standards and controls)</td>
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<tr>
<td>IT infrastructure</td>
<td>Ability to provide the foundation for enterprise applications and services and is comprised of data, network, and processing architectures</td>
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**Table 1. IT Capability Construct Dimensions (Bharadwaj et al. 1999)**
Among the most prominent empirical works on ITC is Bharadwaj (2000)’s highly cited study on the business value of IT. It defines ITC as the “ability to mobilize and deploy IT-based resources in combination or co-present with other resources and capabilities” (Bharadwaj 2000, p. 171). In congruence with the resource-based view that divides organizational resources into tangible, human, and intangible resources (Grant 1991), Bharadwaj (2000)’s definition conceptualizes firm-wide ITC as a combination of a firm’s IT-based resources: (1) IT infrastructures – the tangible resources that reflect a firm’s physical IT infrastructure components, (2) human IT skills – the human IT resources that reflect a firm’s technical and managerial IT skills, and (3) IT-enabled intangibles – a firm’s resource related to knowhow, customer focus, or synergies. In the same spirit, Ravichandran and Lertwongsatien (2005) see ITC as the combination of IS human capital, IT infrastructure flexibility, and IS partnership quality. Similarly, Lu and Ramamurthy (2011) define ITC as “a firm’s ability to acquire, deploy, combine, and reconfigure IT resources in support and enhancement of business strategies and work processes”. They measure ITC as a latent construct that is reflected in three dimensions: (1) the ability to manage IT infrastructures (IT infrastructure capability), (2) the ability to envision and use IT resources to reach strategic business goals (IT business spanning capability), and (3) the ability to proactively look for innovative ways to use existing or new IT resources to meet novel business opportunities (IT proactive stance).

Recently, the ITC construct has been refined to account for increasingly dynamic and digital business environments. In the digital era firms have to accumulate four particular kinds of IT resources (Chan and Ahuja 2015): SMACIT infrastructure (related to social media, mobile apps, or cloud computing), IT-enabled communication resources (e.g., Skype), skilled IT personnel, and complementary IT-enabled intangibles. To manage these IT resources firms need to develop particular ITC that allows them to leverage digital tools, master data digitization, manage outsourcing activities, design and implement adaptable business processes, provide IT-enabled support and training, and use design digital products and services. What is more, ITC is needed to orchestrate and leverage slack resources (Zhu et al. 2017) and in technology-intensive, highly competitive markets a rival firms’ ITC influences one’s own ITC (Choi et al. 2017). Finally, in a time of rapidly evolving IT, firms need to be able to dynamically evolve their ITC. Consequently, recent research has established the notion of IT dynamic capability to account for the heavy changes in organizational functioning that followed the advent of digital technologies (Li and Chan 2016; Mikalef and Pateli 2016). Dynamic ITC can be seen as a “set of specific and identifiable processes that allow firms to leverage both tangible and intangible IT resources in ways that support organizational operations and further the strategic business intent in turbulent environments” (Li and Chan 2016, p. 2).

Over the last decades the ITC concept has been thoroughly investigated in the context of non-digital as well as digital innovation. Past research has shown that firms with superior ITC are able to create superior IT-based innovations (Bharadwaj et al. 1999). What is more, ITC per definition includes the ability to proactively look for new ideas on how to use IT and, thus, ITC depicts an essential aspect of firm’s innovation activities (Lu and Ramamurthy 2011). Additionally, ITC can act as an antecedent for digital options (i.e., a firm’s IT-enabled competences in the form of digitized business processes and knowhow). Digital options, in turn, are positively associated with innovation success (Sambamurthy et al. 2003; Sandberg et al. 2014). Pavlou and El Sawy (2006) argue that a firm’s capability to use IT tools in business processes (IT leveraging competence) positively influences new product development. In the same spirit, Kawakami et al. (2015) and Mauerhoefer et al. (2017) showed that particular ITC (i.e., IT use frequency and IT replacement frequency) are important determinants of successful new product development projects. In technology-intensive, highly competitive environments Choi et al. (2017) found that ITC is an enabler for competitive actions. According to Nwankpa and Datta (2017) a firm’s digital business intensity – its ability to invest in innovative, emerging technologies – influences its ability to pursue digital innovation. They argue that in a world that is permeated by digital technologies, ITC can be seen as an important prerequisite for a firm’s digital business intensity and, thus, its ability to master digital innovation. Finally, IT-based digital (innovation) capabilities enable firms to leverage digital technologies – an important prerequisite for digital innovation and entrepreneurial growth in the era of digital transformation (Tumbas et al. 2017b).

**Advancement of the IT Capability Construct**

The existing literature on the ITC construct shows that even though there have been various refinements to account for increasing market dynamics and digital business environments in its core the ITC construct
has remained unchanged. Most of the theoretical or empirical works on ITC are based on Bharadwaj et al. (1999)’s thoughts. They all share the general sentiment that ITC is a multidimensional construct whose dimensions reflect a firm’s ability to use IT-based resources and usually include dimensions related to a firm’s IT infrastructures, IT human capital, IT management, and IT-business alignment (Bharadwaj 2000; Lu and Ramamurthy 2011; Ravichandran and Lertwongsatien 2005; Wade and Hulland 2004).

Such a view on capabilities in the context of digital innovation is – by its nature – strongly driven by the view of IT departments on organizational functioning. This is in particular reflected by the following three dimensions of Bharadwaj et al. (1999)’s ITC construct: IT business partnerships, IT management, and IT infrastructure. These three dimensions mainly address a firm’s ability to introduce and manage new information systems – or in the context of digital innovation: a firm’s digitalization. Even though digitalization depicts an essential element of digital innovation, digital innovation demands a more transformational view that captures the organizational change induced by digital technologies. Nevertheless, Bharadwaj et al. (1999)’s initial conceptualization of the ITC construct also addresses three typical issues within the scope of digital transformation. Namely, the ability to adapt existing business processes in order to leverage emerging digital technologies (Nambisan et al. 2017; Yoo et al. 2012) – addressed by IT business process integration. The ability to envision strategic uses of innovative technologies (Chen et al. 2014; Lu and Ramamurthy 2011; Svahn et al. 2017) – addressed by business IT strategic thinking. And the ability to leverage networks (Lyytinen et al. 2016) – addressed by external IT linkages. Table 2 classifies Bharadwaj et al. (1999)’s initial ITC construct dimensions accordingly. We see that three of the ITC construct’s dimensions address issues related to a firm’s digital transformation while the other three address topics related to a firm’s digitalization.

<table>
<thead>
<tr>
<th>Effect of digital technologies</th>
<th>IT capability dimension</th>
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<tr>
<td>Digital Transformation</td>
<td>External IT linkages</td>
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<td></td>
<td>IT business process integration</td>
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<td>Digitalization</td>
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<td>IT infrastructure</td>
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**Table 2. Classification of Bharadwaj et al. (1999)’s IT Capability Construct Dimensions**

Unarguably, ITC depicts an essential capability in the context of digital innovation (Fichman et al. 2014; Sambamurthy et al. 2003). However, due to its nature the ITC construct is rather confined to the perspective of IT departments and is mainly centered on a process view on digital innovation (see table 2). Yet digital innovation demands a more holistic, company-spanning view (Bharadwaj et al. 2013; Matt et al. 2015) that also addresses innovative products and business models based on digital technologies (Nambisan et al. 2017). Accordingly, similar to the emergence of new digital strategies (Bharadwaj et al. 2013), new digital management roles (Tumbas et al. 2017c), or new digital organizational cultures (Piccinini et al. 2015), digital innovation also requires new dedicated digital capability concepts (Tumbas et al. 2017b). As a consequence, we suggest an advancement of the ITC construct to account for the idiosyncrasies of digital innovation and propose that in increasingly digital business environments the ITC construct should consist of the following five dimensions.

Firstly, the adoption, adaptation, development, and management of innovative digital technologies which represents the starting point for digital innovation (Nambisan et al. 2017) is based on digital infrastructures (Henfridsson and Bygstad 2013). In line with Bharadwaj et al. (1999) this requires the ability to manage digital infrastructures (i.e., to operate hardware and networks). Secondly, firms need to be able to manage the IT function per se (i.e., IT planning and design, IT applications delivery, IT project management, IT standards management) if they want to leverage digital technologies (Bharadwaj et al. 1999; Mauerhofer et al. 2017; Nambisan et al. 2017; Sambamurthy et al. 2003). This allows them to create and run innovative digital solutions. Thirdly, the development of innovative digital solutions demands the alignment of the needs of the IT and business organization. For this, firms need to closely align business and IT strategies and work practices and encourage business IT partnerships (Bharadwaj et al. 2013; Tallon and Pinsonneault 2011). Fourthly, organizations need the ability to realize the necessary conditions in the form of structures, resources, culture, governance mechanisms and so on that allow them to leverage digital technologies (Kohli and Melville 2018). And fifthly, firms need to be able to
complement digital solutions with innovative digital business concepts. To create and run digital business concepts firms need the ability to proactively think about new ways how IT and digital technologies can act as a source for value creation (Bharadwaj et al. 1999; Lu and Ramamurthy 2011), to leverage technology-based business relationships and create digital innovation networks (Lyytinen et al. 2016), and to improve existing business and IT processes through the use of innovative digital technologies (Bharadwaj et al. 1999; Nambisan et al. 2017; Yoo et al. 2012).

The first two dimensions (digital infrastructures and digital solutions) address the adoption, adaption, development, and management digital technologies and, thus, refer to a firm's digitalization. Accordingly, we summarize these dimensions as digitalization capability. The third dimension (IT business alignment) is in parts attributable to a firm's digitalization efforts since the creation and implementation of all kinds of IT-based solutions demands a close alignment of the IT and business organization (Bharadwaj 2000). However, the alignment of the IT and business organizations also provides the basis for the development and implementation of digital business concepts. Moreover, it is a prerequisite for the implementation of the necessary organizational conditions that facilitate digital innovation. Therefore, the third dimension is in parts also attributable to a firm's digital transformation capability. The fourth and fifth dimension (organizational conditions and digital business concepts) capture the transformative effect of digital technologies and can be summarized as digital transformation capability. Figure 2 shows the presented advancement of the ITC construct. Such an advanced ITC construct is based on Bharadwaj et al. (1999)’s initial ITC construct but, at the same time, recognizes the idiosyncrasies of digital innovation. Following this reconceptualization, two complementary digital capabilities define a firm’s ITC in the context of digital innovation: digitalization capability and digital transformation capability.

**Figure 2. Advanced IT Capability Construct Dimensions**

**Conclusion & Avenues for Future Research**

Principally, we believe that what we found for the context of digital innovation to be valid also for other facets of the organizational transformation induced by innovative IS and digital technologies. Similar to the way ITC is a necessary yet not sufficient condition for digital innovation, ITC, for instance, also matters but is not enough in the management of large amounts of data (McAfee et al. 2012) or the development and management of digital platforms (Tan et al. 2015). Therefore, we generalize our findings on digital innovation to the broader context of digital transformation and argue that in increasingly digital business environments organizations have to embrace the transformative impact of digital technologies. For this, firms have to master the challenges of digitalization and digital transformation. The former refers to the adoption, adaption, development, and management of innovative IS and digital technologies. The latter describes the organizational change induced by digital technologies. Against this backdrop, organizations need to develop sufficiently advanced ITC. However, at the same time digital transformation demands more than ITC and calls for dedicated digital capabilities that go beyond ITC. This means that, in the era of digital transformation, IS research not only needs to rethink the role of ITC, but also needs to scrutinize novel digital capability concepts.

Following such a bimodal stance on IT-based capability research in the era of digital transformation, we encourage IS researchers to abide to one of their research field’s dearest concepts: ambidexterity (Birkinshaw and Gibson 2004) – the ability to balance the exploitation of the existing and the exploration
of the new. Accordingly, we suggest that future IS research should simultaneously (i) pursue the advancement of the ITC construct to account for the idiosyncrasies of increasing digital business environments and (ii) allocate research effort to the development of novel dedicated digital capability concepts. Such a bimodal IT-based capability research stance within the IS field would follow two goals: the refinement of the ITC construct and the development of dedicated digital capability constructs.

In 2013, Chan and Levallet theorized on the role and the past and future evolution of the ITC construct and gave directions for future research in this area. Almost five years later, we believe that there still is a significant need for the further advancement of the ITC construct to account for the idiosyncrasies of increasingly digital business environments and therefore suggest:

**Proposition 1**: Future IS research should conceptually advance and empirically examine the ITC construct in the context of digital innovation and digital transformation.

Moreover, in sync with the proposed bimodal IT-based capability research stance, we encourage IS researchers to think outside of the ITC box and consider other digital capabilities. Therefore, we suggest:

**Proposition 2**: Future IS research should conceptually develop and empirically examine dedicated digital capability concepts in the context of digital innovation and transformation.

Finally, against the backdrop of emerging digital capability concepts, theory and practice would benefit from research that investigates the conceptual differences and the interplay of the ITC construct and dedicated digital capability constructs. Therefore, we suggest:

**Proposition 3**: Future IS research should conceptually and empirically examine the interplay of ITC and digital innovation capabilities.

**Implications & Limitations**

Our paper offers several theoretical contributions. Firstly, we provide a technology-centered model of digital innovation that consists of three building blocks: digital technologies, digital solutions, and digital business concepts. Secondly, we offer a reconceptualization of the ITC construct that accounts for the idiosyncrasies of digitalization and digital transformation. Thirdly, we provide avenues for future IT-based capability research in the context of digital innovation and transformation. Finally, we extend existing theory on digital capability concepts. In the case of digital innovation, for instance, we argue that digital innovation capabilities provide organizations with the means to use digital technologies in innovative ways and, thus, enable them to create value. Our paper also has significant practical implications. We highlight the importance of a firm’s ITC in the era of digital technologies and indicate that successful digital innovation may demand more than ITC and call for dedicated digital capabilities.

Nevertheless, this study is not without limitations. Firstly, our paper is of conceptual nature and, thus, only indirectly through the reviewed literature based on empirical evidence. Secondly, we generalize our findings on how ITC contributes to a firm’s digital innovation success. This way, we ignore specifics of firms from different industries or of varying sizes and regional or cultural backgrounds. Thirdly, our conceptualization of digital innovation is technology-centered and, thus, neglects other possible perspectives (such as a customer-centered conceptualization of digital innovation).

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