

# Unpacking the Difference Between Digital Transformation and IT-Enabled Organizational Transformation

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## Abstract

Although digital transformation offers a number of opportunities for today's organizations, information systems scholars and practitioners struggle to grasp what digital transformation really is, particularly in terms of how it differs from the well-established concept of information technology (IT)-enabled organizational transformation. By integrating literature from organization science and information systems research with two longitudinal case studies—one on digital transformation, the other on IT-enabled organizational transformation—we develop an empirically grounded conceptualization that sets these two phenomena apart. We find that there are two distinctive differences: (1) digital transformation activities leverage digital technology in (re)defining an organization's value proposition, while IT-enabled organizational transformation activities leverage digital technology in supporting the value proposition, and (2) digital transformation involves the emergence of a new organizational identity, whereas IT-enabled organizational transformation involves the enhancement of an existing organizational identity. We synthesize these arguments in a process model to distinguish the different types of transformations and propose directions for future research.

**Keywords:** Digital Transformation, IT-Enabled Organizational Transformation, Organizational Identity, Value Proposition, Imposition, Reconciliation, Digital Technology, Process Model

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*All the digitization in the world won't, on its own, make a business a digital company.*  
(Ross, 2017)

## 1 Introduction

Interest in digital transformation (DT) is spreading across academia and practice at a breathtaking pace. This is evidenced by the increasing number of information systems (IS) publications devoted to this topic (Baiyere, Salmela, & Tapanainen, 2020; Hinings,

Gegenhuber, & Greenwood, 2018; Vial, 2019) in addition to special issues (Lanzolla et al., 2018; Majchrzak, Markus, & Wareham, 2016; Pappas et al., 2019), commentaries in leading outlets (Agarwal et al., 2010; Lucas Jr. et al., 2013; Majchrzak, Markus, & Wareham, 2016), business practice debates (McKinsey, 2016), and policy documents (World Economic Forum, 2017) on DT. The scholarly attention devoted to this topic and the significant businesses and policy investments in DT clearly mark it as a leading technology-related phenomenon. Yet, as

attention and investments increase, conceptual questions emerge regarding whether DT really is a new phenomenon or whether it is merely an appealing label used to depict change processes that researchers in management (Mintzberg & McHugh, 1985; Mintzberg & Waters, 1985; Pettigrew, 1987, 1990) and IS have already scrutinized for decades (Barrett & Walsham, 1999; Berente et al., 2016; Gregory et al., 2015; Henderson & Venkatraman, 1992; Lyytinen & Newman, 2008; Orlikowski, 1996). By the 1990s “IS/IT-enabled organizational transformation” (ITOT) had emerged as an IS concept deriving from studies on the transformation impacts of enterprise resource planning (ERP) systems on organizations. Since then, it has grown into a rich and insightful body of work, offering frameworks and explanations to improve the understanding of when and why IT-related transformation processes are successful and how these processes develop over time (for overviews, see, e.g., Besson & Rowe, 2012; Crowston & Myers, 2004; Orlikowski, 1996). This rich body of literature raises the question of how DT is different from what is already known at the organizational level. Indeed, this question is central if we wish to advance the IS field and improve practitioner resource allocations. Simply assuming that DT is new and different, without a conceptual delineation from prior concepts, risks effectively reinventing the wheel and rendering the novelty of IS suggestions for business practice opaque, as has been highlighted by recent commentaries (Andriole, 2017; Kane, 2017). At the crux of the matter is the fact that DT is currently conceptualized in almost exactly the same way as ITOT (Besson & Rowe, 2012; Vial, 2019), which would seem to contradict current calls to revisit classical models of transformation in order to clarify how digital transformation is different from ITOT (Yoo, 2013; Yoo, Henfridsson, & Lyytinen, 2010).

This paper seeks to deliver the first empirical study devoted to disentangling these two transformations based on an analysis of two cases: Alpha, a French hospital, implemented an electronic medical record (EMR) in an attempt to become the world’s most digital hospital, whereas Beta, a Finnish manufacturing company, implemented a new strategy to transform its core value-creating activities from selling machinery to providing services based on digitally augmented machines. Following principles of grounded theory (Corbin & Strauss, 2008; Seidel & Urquhart, 2013), we were able to identify two distinct ways in which each organization related digital technology to its value proposition. Thus our overarching research questions are: (1) *How is digital transformation different from IT-enabled organizational transformation?* and (2) *How do digital and IT-enabled organizational transformations develop over time?*

Overall, we suggest that, while there are similarities and nuanced differences in terms of transformation agendas and driving forces, the key differentiator between DT and ITOT, at the organizational level, lies in how digital technology, value propositions, and organization identity interrelate in these respective processes. In DT, digital technology is central to redefining value propositions, which leads to the emergence of a new organizational identity. ITOT, in contrast, involves the use of digital technology to support and reinforce an existing value proposition and identity. Our contribution is twofold: First, we provide an empirically grounded conceptual differentiation between DT and ITOT, foregrounding fundamental differences as well as similarities that earlier work relegated to the background. Second, we unpack the dynamics that characterize each transformation.

## 2 Theoretical Background

For several years, if not decades, a rich body of IS literature has explored transformation, “a process that engenders a qualitatively different organization” (Besson & Rowe, 2012, p. 103) (for an overview, see, e.g., Besson & Rowe, 2012; Crowston & Myers, 2004; Orlikowski, 1996). Under the ITOT heading (Besson & Rowe, 2012), IS scholars have argued for the importance of transforming organizations in order to align functional IT strategies with business strategies (e.g., Brown & Magill, 1994; Chan et al., 1997; Scott Morton, 1991). More recently, scholars have increasingly challenged this “alignment view” (Henderson & Venkatraman, 1999), stating that digital technologies increasingly shape business strategy (Bharadwaj et al., 2013) and organizational contexts (Yoo et al., 2010, 2012); hence, classical models beg reconsideration, given the underlying logic that strategy shapes technology but not vice versa (Baskerville, Myers, & Yoo, 2019; Yoo, 2013). Although the literature on DT is emerging rapidly in areas of research (e.g., Vial, 2019), practice (Knickrehm, Berthon, & Daugherty, 2016; McKinsey, 2016), and policy (World Economic Forum, 2017), few of these contributions distinguish between DT and ITOT.

### 2.1 Conceptualization of ITOT in IS Research

#### 2.1.1 Tracing the Historical Foundations of Transformation in IS

A key publication that defines the path along which we, as a field, think about transformation is Henderson and Venkatraman’s (1992) chapter that highlights the strategic role of IT in supporting an existing business strategy (cf. Henderson & Venkatraman, 1999; Venkatraman, 1994). The key idea behind this work is that IT, as a tool, can be leveraged to align

organizations with their strategic objectives (Brown & Magill, 1994; Chan et al., 1997; Scott Morton, 1991). Until recently, it has been a widely accepted assumption that successfully aligning IT with business strategies of organizations has positive performance effects (Chan & Reich, 2007; Gerow et al., 2014). Consequently, transformation is broadly considered to be a strategic necessity in order to achieve favorable or superior levels of organizational performance (Henderson & Venkatraman, 1999).

The conceptualization of IT as a means to achieve alignment has substantially shaped how IS scholars think about ITOT. Despite studying ITOT from diverse angles, such as business process reengineering (Hammer & Champy, 1993), IS strategy (Besson & Rowe, 2012), and practice theory (Barrett & Walsham, 1999; Orlikowski, 1996), scholars interested in ITOT have mainly focused their efforts on addressing questions that arise after managers have implemented IT in order to “revolutionize” (Hammer & Champy, 1993) their businesses. For example, scholars working on organizational “deep structures” have found that core values, power distribution, and existing control mechanisms in organizations explain why implementing strategic IS poses difficulties (Heracleous & Barrett, 2001; Silva & Hirschheim, 2007; Soh et al., 2003) and have hence offered important explanations for why achieving alignment is a challenging endeavor (Gerow et al., 2014; Sabherwal, Hirschheim, & Goles, 2001).

Other scholars have worked on how to design effective transformation processes (Galliers, 1998), suggesting, for example, that alignment can be reached through incremental processes during which small-scale changes, combined with existing practices, accumulate over time (Järvenpää & Ives, 1996; Orlikowski, 1996; Robey & Sahay, 1996). Furthermore, scholars have argued that the agency of executives to design transformation initiatives (Abraham & Junglas, 2011; Cooper et al., 2000; Cooper, 2000; Sarker & Lee, 1999) may not align with the agency of organizational members who enact the transformation (Boudreau & Robey, 2005; DeSanctis & Poole, 1994; Orlikowski, 2000). While drawing broadly on various theories, methods, and levels of analysis, the literature on ITOT has generally examined how interactions between organizational contexts and IT systems impact transformation.

While research on ITOT builds on a long-standing trajectory, DT is, perhaps, *the* proverbial “hot topic” of current IS research, as suggested by the increasing number of publications in leading IS outlets devoted to this topic (see Vial 2019 for a review). Generally, current research defines DT as the use of digital technologies to improve business outcomes (Fitzgerald et al., 2014; Liere-Netheler, Packmohr, & Vogelsang, 2018; Piccinini et al., 2015), technology-driven

changes in core business processes (Demirkan, Spohrer, & Welser, 2016; Nwankpa & Roumani, 2016; Singh & Hess, 2017), automation of tasks (Clohessy, Acton, & Morgan, 2017; Horlach et al., 2017; Legner et al., 2017), transformation driven by IT (Hartl & Hess, 2017; Heilig, Schwarze, & Voss, 2017), or impacts of IT on organizational contexts (Haffke, Kalgozas, & Benlian, 2016; Hess et al., 2016; Matt, Hess, & Benlian, 2015). Other definitions suggest that DT emphasizes alignment (Li et al., 2017) or improved use of ERP systems (Chanias, 2017). The logic underlying most definitions, however, relies on the expectation that some sort of digital technology will lead to favorable business outcomes.

The idea of using digital technology to improve business outcomes is also what guides most theorizing in the area of DT (Li et al., 2017; Vial, 2019). Digital technologies such as analytics (Dürr et al., 2017; Günther et al., 2017), cloud computing (Clohessy et al., 2017; Du, Pan, & Huang, 2016), and platforms (Tan et al., 2015; Tiwana, Konsynski, & Bush, 2010), are often seen as forces that disrupt markets (Lucas Jr. et al., 2013; Vial, 2019) in ways that organizations should address (Li et al., 2016; Matt et al., 2015; Yeow, Soh, & Hansen, 2018). Moreover, organizations continuously experience internal transformations that change how they create value (Dremel et al., 2017; Günther et al., 2017; Huang et al., 2017; Porter & Heppelmann, 2015; Wulf, Mettler, & Brenner, 2017) and structure their processes (Morakanyane, Grace, & O'Reilly, 2017; Piccinini et al., 2015) and that identify ways to overcome inertia (Kohli & Johnson, 2011; Roecker, Mocker, & Novales, 2017; Töytäri et al., 2017).

### **2.1.2 Conceptual Confusion and a Search for Clarity**

The existing literature on DT parallels the literature on ITOT in many ways. While the literature on DT takes more recent digital technologies as a starting point (Yoo, 2010; Yoo et al., 2010), it conceptualizes the changes associated with such technologies in ways that are familiar from ITOT research. For example, some definitions of DT directly reference “alignment” (Li et al., 2017) or ERP systems (Chanias, 2017)—i.e., topics that IS scholars have worked on since the early 90s. Others suggest that DT refers to the use of digital technology for the sake of advancing business outcomes; however, save for the technology being different, this is conceptually very similar to what alignment scholars have been working on for decades. Likewise, conceptualizing DT as a process wherein organizations react to technological change and have to deal with internal problems resembles some of the key topics that ITOT scholars have long researched.

Therefore, the question that remains to be answered is how DT and ITOT differ. Extant work has tried to

provide an answer to this question by differentiating them in relative terms. Vial (2019) argues that DT is an evolutionary step of ITOT that unfolds on a larger scale and that there is a set of properties that differentiates them. For example, whereas the impetus for ITOT would be a managerial decision, the impetus for DT would be wider, comprising “society and industry trends” (Vial, 2019, p. 132). Hartl and Hess (2017) also use a relative distinction, suggesting that digital technology affects organizations more holistically and at a faster pace.

However, at the crux of these relative distinctions is that the boundary between the two is blurry and hard to grasp. For example, it is not clear where managerial decisions begin and where industry trends end. Likewise, even alignment can imply an organizational transformation at a quick pace with holistic effects. Hence, trying to differentiate the two processes in relative terms may make sense at a very high level, but once scholars move into more concrete empirical research, it may quickly become difficult to uphold a clear boundary between ITOT and DT.

In summary, we believe that the abovementioned problem results from the more fundamental issue that we, as a field, think about DT using the same assumptions that shaped the debate around ITOT going back to Henderson and Venkatraman (1992). This stands in stark contrast to calls for changing these assumptions when we talk about DT in order to account for the distinctive qualities of digital technologies (Bharadwaj et al., 2013; Yoo, 2013; Yoo et al., 2010).

## 2.2 Using Identity to Disentangle ITOT and DT

Whereas much of the literature has conceptualized ITOT and DT according to their strategic significance, leading to remarkable conceptual similarities between these processes (see above), in this paper, we suggest that DT can be distinguished from ITOT if we attend to the consequences for organizational identity invoked by strategic initiatives involved with any type of transformation. Specifically, a focus on the interrelation between dynamics in value propositions and organizational identity has “earned its way” (Glaser & Strauss, 1967) into our inquiry through multiple rounds of coding and analysis (Berente & Yoo, 2012; Gregory et al., 2015; Suddaby, 2006).

Organizational identity offers a powerful complement to extant conceptualizations of different transformations, as it is widely recognized that digital technologies enable organizations to offer very different value propositions built around data, services, and digitally augmented products (Barrett et al., 2015; Günther et al., 2017; Huang et al., 2017; Yoo et al., 2010). There are several examples that highlight the importance of links

between organizational identity and value propositions. For example, Netflix changed from being a provider of rental movies to being a streaming platform. However, the literature on organizational identity does not necessarily capture the importance of value propositions. Similarly, the broader literature that focuses on value propositions does not typically reflect the importance of organizational identity (Baiyere et al., 2020; Chesbrough, 2010; Chesbrough & Rosenbloom, 2002). Yet a strategic change such as altering the value proposition of an organization may have profound implications for how individuals, groups, and organizations think about who they are and what they do (Whitley, Gal, & Kjaergaard, 2014). This is captured by the concept of organizational identity, which considers what an organization *is* (Albert & Whetten, 1985; Whetten & Mackey, 2002) and how its members can make sense of what the organization claims to be (Corley & Gioia, 2004; Gioia & Thomas, 1996).

Both of these dynamics likely intertwine with changes in value propositions during transformation. For example, the literature on DT is replete with examples of executives claiming to make their organizations “more digital” (Haffke et al., 2016; Singh & Hess, 2017) but we know next to nothing about how middle management or even workers on the “ground floor” react to such claims (Alvarez, 2008; Leclercq-Vandelannoitte, 2014; Van Akkeren & Rowlands, 2007). The literature on organizational identity enables us to forge this link between value propositions and organizational identity through two dimensions suggested by Ravasi and Schultz (2006): relatively stable “identity claims” made by top management about what an organization is (Whetten, 2006; Whetten & Mackey, 2002) and more dynamic “identity understandings” that unfold among organizational members who relate to and enact an identity set forth by top management (Corley & Gioia, 2004; Gioia, Schultz, & Corley, 2000; Gioia & Thomas, 1996). These dimensions interact during transformation (Nag, Corley, & Gioia, 2007; Ravasi & Schultz, 2006), for example, when the introduction of new IT affects organizational identity (Alvarez, 2008) or a new identity emerges through IT-mediated interactions between different organizations (Gal, Blegind Jensen, & Lyytinen, 2014; Gal, Lyytinen, & Yoo, 2008).

Against this background, there are several studies that link the dynamics of technology, transformation, and identity. Some of the most influential work in this area includes Barley’s studies on how CT scanners have altered the role of the relationships among organizational members (Barley, 1986) and on how these technologies alter the relational and nonrelational elements of one’s role in the work context (Barley, 1990; see also, Barrett & Scott, 2004; Barrett & Walsham, 1999; Lamb & Davidson, 2005; Walsham, 1998). These insights offer powerful starting points to



delve into the different identity-related microdynamics that may arise during different transformation processes, as managers often ask organizational members to engage in new work practices (Reay et al., 2017) that are aligned with an organization's value proposition.

When identity-related dynamics are set into motion during transformation, they often pattern how organizational members learn (Besson & Rowe, 2012; Lyytinen & Newman, 2008; Silva & Hirschheim, 2007). Several IS work practice changes that entail learning how to use new ICTs (Boudreau & Robey, 2005; Robey, Ross, & Boudreau, 2002; Robey & Sahay, 1996) and strike balances between contradictory tensions associated with IT (Gregory et al., 2015) have been found to be linked with organizational identity (Barrett & Walsham, 1999; Robey & Boudreau, 1999). This is particularly meaningful for DT since formulating strategies or value propositions typically calls into question the existing identity of an organization (Dutton & Dukerich, 1991; Gioia & Chittipeddi, 1991) while rendering its current knowledge base less valuable (Cook & Yanow, 1993; Nag et al., 2007). The intertwining of identity and learning when managements push for such changes thus forms a valuable means for unpacking the differences between ITOT and DT.

## 3 Method

### 3.1 Overview: Research Design and Paper-a-thon Provenance

We aim to conceptually disentangle DT and ITOT on the basis of an empirical study that emerged from the inaugural "Paper-a-thon" at the International Conference on Information Systems (ICIS) in 2017 in Seoul. At the Paper-a-thon, two of the authors of this paper contributed datasets on the implementation of digital technologies and strategies in two organizations, which we call "Alpha" and "Beta" to preserve anonymity. The former is a French hospital seeking to transform itself into "the world's most digital hospital" (Alpha CEO), and the latter is a Finnish manufacturing company aiming to transform itself into a "leading provider of digital services" (Beta internal document) with plans to pivot from selling machinery and hardware alone. By inductively analyzing these cases, our focus on disentangling ITOT and DT emerged when we recognized that Alpha resembled comparatively more of the former while the opposite was true for Beta. The authors doing the fieldwork closely investigated Alpha for 18 months and Beta for slightly over a year. They entered the field when the intention to transform each organization had been formulated and implementation was beginning. Discussing the cases at the Paper-a-thon revealed that both cases were similar in several ways. In the first iteration of our analysis of the two datasets, we

decided to conceptualize the similarities between the cases using an "imposition" lens (Strong & Volkoff, 2010). While this intermediate idea (Baiyere, Cha et al., 2017) changed in many ways over time, it shaped the building blocks of transformation in our final model.

Following the Paper-a-thon, iterations between data and the literature led to an emergent understanding of how our data related to and extended prior literature. It became clear to us that one case more clearly reflected ITOT characteristics while the other was more similar to what we call DT. In subsequent analysis of the data, we began to focus our attention on the differences between these two cases. We realized that the differentiating criteria were connected to the interrelation between dynamics in value propositions and organizational identity. We conducted this process of analytic reflexivity (Srivastava & Hopwood, 2009) in two steps described in more detail below:

1. The authors, who were in the field collecting data, wrote narratives of each case (Langley, 1999) with the purpose of understanding the data and identifying important aspects that could help sharpen the emerging conceptual categories (Berente & Yoo, 2012; Corbin & Strauss, 2008; Gregory et al., 2015). This proved useful in identifying the commonalities and differences between the transformation processes in both cases.
2. All authors were involved in the iterative analysis step that aimed to both consolidate and develop a process model delineating DT and ITOT (Berente & Yoo, 2012). We deployed visual mapping, which is a technique for organizing first-order observations over time by drawing process diagrams that interconnect observations using "boxes and arrows" (Langley, 1999).

### 3.2 Data Collection and Analysis

Because of the longitudinal nature of our study, we drew on different data sources for our empirical evidence (See Table 1). For Alpha, we relied on five interviews with managers and secretaries. All interviews were conducted at Alpha's location in France. The interviews lasted 50 minutes on average and were transcribed verbatim. Interview questions captured the perspectives of different organizational members on the ongoing transformation process, particularly regarding the way in which the implementation of an EMR system was affecting and shaping the work practices in the hospital. In addition, we carried out 320 hours of nonparticipant observation of various events occurring during the transformation process. We conducted these observations via weekly visits to the organization. We were privileged to participate in meetings and had several interactions with organizational members over the course of the study.

**Table 1. Summary of Data Collection**

	<b>Case 1: Alpha</b>	<b>Case 2: Beta</b>
<b>Context</b>	Health care	Manufacturing
<b>Duration</b>	18 months	13 months
<b>Interviews</b>	5 interviews with the hospital's top manager, the senior manager, and secretaries	41 interviews with senior management, middle management, and operational employees
<b>Observations</b>	320 hours of observation of practices and activities related to the DT efforts and 21 hours of meeting observations	224 hours of observation of practices and activities related to the DT efforts 42 hours of meeting observations
<b>Archival documents</b>	2,000 emails, 6 documents (1 related to the hospital's policy and 5 official reports related to the meetings held)	52 documents (including strategy documents, monthly reports, presentations, and intranet archives)

Part of these observations focused on how secretaries dealt with challenges that resulted from the EMR. Specifically, we observed approximately 21 hours of meetings devoted to sorting out these challenges. We took notes during these observations, which were supplemented by the meeting minutes. We also gained access to about 2,000 internal emails, which served as a primary data source. As Alpha is a bureaucratic hospital, much of the communication is necessarily written and official. Hence, emails played a key role in this case. Internal strategy documents complemented our data, which were triangulated across sources to ensure validity.

Data collection at Beta proceeded along similar lines. In this case, interviews proved to be more important for uncovering the rationale behind the ongoing transformation. During our 13-month investigation, we conducted 41 interviews with management and employees at different hierarchical levels. The interviews lasted from one to two hours and were transcribed verbatim. Interview questions addressed the rationale behind the transformation and the development of transformation plans over time across different levels of the organization. We further collected data during 224 hours of nonparticipant observation and 42 hours of workshops and regular meetings. Nonparticipant observations occurred via weekly visits to the organization over several months.

These visits also included attending exhibitions by the organization at fairs where the salespeople and the marketing team showcased innovations to attract new customers. We also observed Beta's monthly meetings where members of the entire organization assembled at the headquarters to listen to the chief executive officer (CEO) and leadership team present the status quo (financial, ongoing, and anticipated projects, human resources, etc.) and the strategic vision for leveraging digital technology to advance the organization. Observations occurred through active participation in workshops and ideation meetings organized and conducted at Beta. We took notes during observations or directly after the corresponding events. Finally, we

collected archival data in the form of 52 documents covering Beta's DT process. The data collection is summarized in Table 1.

We adopted an inductive approach, involving constant comparison among different data sources and framing our emergent understanding in light of the conceptual sensitivity derived from prior literature. Our approach is consistent with the grounded theory methodology applied by Berente and Yoo (2012) and with studies that build theory (Corley and Gioia, 2004; Nag et al., 2007). Thus, we first engaged in open coding to discover concepts, their properties, and relationships within the data (Berente & Yoo, 2012; Seidel & Urquhart, 2013). During this process, we assigned descriptive codes to our data that oftentimes reflected informant language (Gioia, Corley, & Hamilton, 2013). We then began synthesizing these quotes into more analytical concepts that still related to the cases but reflected emerging abstractions (Gioia et al., 2013). These abstracted concepts formed the basis for theorizing the distinction between DT and ITOT from our data.

Specifically, and consistent with Klein and Myers's (1999) principle of abstraction and generalization, we iterated between our initial set of concepts and the existing literature (including misfit, alignment, practice theory, digital innovation, and identity, among others). These iterations yielded an initial understanding of the differences between ITOT and DT at micro- and macrolevels. First, by taking a macrolevel view in engaging with the data, we increasingly began to understand how central the relationship between value propositions and organizational identity (Albert & Whetten, 1985; Gal et al., 2008; Ravasi & Schultz, 2006; Whitley et al., 2014) is for understanding the differences between these two transformations. By carefully tracing and examining the trajectory of both transformations, we found that Beta's transformation entailed redefining the value proposition based on digital technology, leading to a change in the identity of the organization. In contrast, Alpha's transformation primarily involved

implementing IT in order to support an existing value proposition to enhance the hospital's existing identity. This preliminary finding supported our "hunch" that the interrelations between value propositions and identity matter greatly in distinguishing DT from ITOT. This step of our analysis provided us with the overarching conceptual dimensions on the macrolevel of the organization where value propositions and identity shape the building blocks of transformation—that is, its technological change, transformation agenda, transformation activities, impositions and reconciliations, as well as the ensuing organizational-identity outcome.

Second, by probing the data for differences on the microlevel, we shifted our attention to the inner workings of the transformation processes, consciously moving beyond the focus on strategies revealed by previous literature. We particularly questioned the data regarding the role of digital technology and examined the effect of the transformation process on work practices. By looking at the transformation activities, we discovered that digital technology remained relevant but played different roles (redefining or supporting) in shaping value propositions in both transformations. By comparing the activities surrounding the creation of value in both cases, we were able to highlight the difference in the interplay between digital technology and these activities—i.e., core value "(re)defining" activities at Beta and core value "supporting" activities at Alpha. In revealing the work practices, we specifically narrowed our analysis to two roles that appeared to us to be of surprisingly high relevance to the transformation agenda of both cases and indicative of the roles capturing work practices on an operational level.

At Beta, our DT case, we found sales personnel to be particularly relevant in this context because the process of transformation threatened to morph their role to that of a consultant. Their reluctance and initial inability to sell digital products turned out to be pivotal to the progress of the transformation. At Alpha, we found secretaries to be particularly relevant, as new tasks resulting from the EMR system were grafted onto their existing roles. This resulted in their reluctance to use EMR and created unexpected bottlenecks that made it difficult to attain the transformation agenda. Sales personnel and secretaries responded to the impositions arising from these transformation activities, leading to a need for reconciliation actions. We summarized these microlevel interactions, categorizing them into second-order concepts that we then abstracted into macrolevel dimensions. We summarize our analysis through the representative data (Gioia et al., 2013) presented in Table 2 at the end of Section 4 and in a process model that captures the similarities and differences between DT and ITOT (see Figure 1).

## 4 Findings

### 4.1 Alpha: Transforming into the Most Digital Hospital in the World

Alpha is a university hospital in southern France with a capacity of 2,700 beds and approximately 10,000 employees working in primary, intensive, and emergency care units. On an average workday, Alpha personnel oversee around ten births, provide 2,000 external consultations, and conduct 155 surgeries and 1,220 radiographies. Every day, the hospital treats about 340 emergency patients, 500 ambulatory patients, and 220 inpatients. Alpha's core purpose (its value proposition) is to provide health care services and perform research. In 2012, the hospital decided to improve its work practices by introducing electronic medical record (EMR) technology, using IT to transform the organization in order to better fulfill that core purpose.

#### 4.1.1 Technological Change: Challenges and Opportunities

Alpha has an excellent reputation as a leading university research hospital providing high-quality medical care. Its staff regularly publish in highly ranked journals and clinical trials conducted at Alpha have wide-ranging impacts. The expertise and knowledge of Alpha's doctors and researchers is crucial to the hospital's success; hence, top management grants them high levels of autonomy. Apart from standard procedures and strict hygiene requirements before and after surgery, there are very few official guidelines delineating how clinical work and research should be conducted.

Alpha's ambition is to become a world leader in terms of research and quality of care. Thus, the formal structure of the organization comprises highly specialized units and departments conducive to the development of expert knowledge in the respective domains. Largely autonomous specialists frequently acquire diverse software packages to support consultations, research, or resident training, with the unintended consequence that, over time, different departments have become information silos operating on stove-piped IT systems. By 2010 more than a hundred different software applications were being used, producing vast amounts of patient-related data scattered across different hospital departments.

While this situation was consistent with Alpha's ambition to develop multiple medical specialties, the differentiation of departments had a detrimental effect on the efficiency and timeliness of hospital operations. Moreover, some patients with multiple chronic conditions needed to consult several departments, which meant that information had to be exchanged and integrated between departments. In 2012, Alpha's

management recognized that the difficulty of doing this was undermining the hospital's ambition to deliver excellent health care services. Top management decided to leverage the affordance of digital technology to facilitate the integration and exchange of information across hospital departments and announced the new goal of becoming the most digital hospital in the world.

#### 4.1.2 Transformation Agenda

The Healthcare Information and Management Systems Society (HIMSS) has established a scale to measure the degree to which electronic medical records (EMR) have been adopted by organizations. Alpha's ambition was to reach the highest level, Level 7, reflecting "the adoption and utilization of EMR functions required to achieve a paperless environment that harnessed technology to support optimized patient care." (Alpha CEO). Therefore, an EMR system was introduced to facilitate cross-departmental information exchange, improve the timeliness and effectivity of health care delivery, and integrate information produced in different parts of the hospital into streamlined business processes. Specifically, it was decided that "imaging, digital dictation, medical devices, and digitalizing medical records have to be optimized" (Alpha official document: "Hospital's Strategy for the Information System, 2013-2017"). Management pushed toward this goal rapidly, in what was sometimes referred to as a "big-bang mode." (Alpha CEO) According to a strategy document "Alpha wishes to arrive at zero paper as soon as possible" because allowing paper and computer systems to overlap was deemed to be "very costly, demotivating, counterproductive, and a risk generator" (Alpha official document: Hospital's Strategy for the Information System, 2013-2017"). As the Alpha CEO stated: "I wanted a fast go live for the new system; if we keep two systems, we can be certain that the old system 'wins.'"

Alpha rolled out the EMR across all departments other than Emergency Care. Functions were focused on supporting health care services and included modules for the admission, discharge, and transfer of patients, computerized physician order entry, treatment planning, resources and appointment scheduling, and a clinical data warehouse. The use of EMR implied a number of organizational changes to ensure system maintenance, quality of information, and doctors' compliance with legal requirements related to patients' data privacy and security. Doctors were asked to use the EMR to document prescriptions and treatments but, beyond that, the new system did not fundamentally alter how doctors treated patients. A more far-reaching change was anticipated regarding the work of secretaries, who would now have to use the EMR to schedule appointments so that up-to-date patient information could be easily retrieved.

#### 4.1.3 Consequences of the EMR Implementation and Impositions on Work Practices

Most of Alpha's key personnel reacted favorably and recognized the benefit of using the EMR rather than paper files to centralize, share, and transfer information. Nevertheless, challenges arose in the context of transforming secretarial work. In contrast to the autonomy granted doctors, secretarial work at this hospital is highly formalized and structured by a corpus of rules prescribing how secretaries should perform their work. Traditionally, they created and maintained paper-based patient files and passed them on to the medical providers treating patients. Changing this system led to difficulties, particularly regarding information-intensive materials such as radiology images.

Patients often bring radiology images from independent doctors external to Alpha. Traditionally, these images were in x-ray format and were included in patient files. Increasingly, however, patients began bringing in radiology images in digital format. Secretaries were then expected to copy images from a CD-ROM and paste them into the EMR system, tagging them with relevant patient information such as name, age, and gender. In theory, this was a good thing, as digital images could be easily integrated into the EMR and made available throughout Alpha. According to Alpha CEO, "the EMR allows to access and utilize data in real time. Earlier IT could not do that." Of course, departments such as cardiology or ophthalmology work more with radiology exams than departments like psychiatry, meaning that secretaries in certain departments were suddenly confronted with the need to handle large numbers of digital images, which created difficulties.

While secretaries were used to working according to strictly bureaucratic rules, initially there was no rule clarifying the handling of radiology images, and secretaries in different departments managed them in different ways. For example, whereas a cardiology secretary might process radiology images right after each patient examination, a psychiatry secretary might postpone the processing of images until the end of her shift. Moreover, the use of EMR required secretaries to integrate new and additional tasks into their work practices. Many secretaries reported feeling lost when trying to download, index, and upload pictures to the EMR. The hospital's information officer reflected on the new situation faced by secretaries: "It's necessary to put a better analysis in place to formalize this task. But it's also necessary to resolve the differences in secretaries' work practices." While the EMR system was intended to replace existing legacy systems and optimize procedures, in reality, it increased the workload of secretaries and a majority of them felt overwhelmed by the system. Consequently, the uptake of the EMR among secretaries was slow and failed to meet expectations.



A further problem that arose involved digital indexing, which, in Alpha's Picture Archiving and Communication System (PACS), involved 11 steps and 10 additional steps for downloading images using the special CD transfer software required by the EMR. This process took around 20 minutes, assuming the system was functioning correctly, which was not always the case. As one secretary complained:

*The PACS is slow in the afternoon. We were told that we could not work because too many people tried to access the server. We were told to do something else and then return to this task ... Uploading digital images is cumbersome due to bugs and the systems being slow. (Alpha secretary)*

Secretaries described the process as tedious and lengthy, and they also viewed this standardization as clashing with the department-specific workflows they had experienced in the past. Therefore, many secretaries considered digital indexing to be a nuisance. Secretaries were particularly afraid of making mistakes, such as unintentionally registering patients twice in the system, which would result in confusion among doctors about which of the two files to use. As the secretaries' representative explained, "there are different paths on how to upload and index digital images. This makes the whole process error prone." Indeed, errors were already occurring. For example, one patient complained that the MRI scans he received from a secretary on a CD-ROM belonged to another patient. Such incidents increased pressure on secretaries, especially given the increasing use of CD-ROM for radiology images.

A secretaries' representative summarized the problem this way:

*We have to define clear rules on how to upload and index digital images ... The process is complex and requires experience and expertise, because it contains several steps and the patient's ID is sometimes not recorded correctly—or worse, not recorded at all. Moreover, there are more and more images brought by patients and the secretaries are not sure how to deal with those. (Alpha secretaries' representative)*

#### 4.1.4 Reconciling the Issues

Between late 2015 and summer 2017, Alpha's senior management realized that the secretaries' use of the EMR system did not live up to their expectations. The secretaries' representative kept track of the time used for digital indexing and used these insights to voice concerns to senior officials from HR and to the hospital information officer. A follow-up study documented that the current use of the EMR system was not optimizing workflow, that secretaries needed more

training, and that more knowledge on how specialists in different departments worked was needed. In response, senior management initiated the design and implementation of a formal plan outlining how to train secretaries in using the EMR and how to integrate EMR with existing software like Alpha's PACS. Furthermore, senior management and a radiology technician arranged workshops to deal with secretaries' work overload and the lack of formal training for digital indexing. A key question discussed in relation to work overload was: Who should perform digital imaging? Should it be performed by all secretaries, a few secretaries, or by radiology technicians? Furthermore, discussions also addressed how a digital indexing tutorial could protect secretaries from legal action in case of errors.

The discussions continued over several internal email conversations in which the hospital information officer acknowledged a central problem and proposed a potential solution:

*Unfortunately, this (current) solution does not satisfy users because the response times are extremely long ... We therefore face a real problem. To make certain that the patient ID issue is resolved, we want the secretaries who are closer to the patients than the radiology technicians to be able to index pictures and return the CDs to the patients immediately. Hence, it will be necessary to automate indexing and acquire new software ... Now you've got to make a decision that I obviously cannot make alone and that's why I'm asking all of you. (Alpha doctor / hospital information officer)*

Several changes emerged as a consequence of these discussions. A tutorial was introduced to teach secretaries how to perform secure indexing. Also, digital imaging training was integrated into routine secretarial training. Moreover, as a compromise, it was decided that secretaries and radiology technicians would split the indexing tasks in very busy departments as a means of reducing the workload of secretaries: "So secretaries will upload and index images in those departments that are very busy while in the other departments the radio[logy] technicians will do this duty" (Alpha doctor / hospital information officer).

These measures enabled secretaries to learn how to use the EMR technology effectively in order to achieve the management's goal of improving work practices. The difficulties mentioned above made the implementation process slower and more expensive than planned, but the EMR was eventually integrated into Alpha. Today, Alpha's core purpose of providing health care services and undertaking research remains unchanged and has, in fact, been reinforced by the new EMR.

## 4.2 Beta: Becoming the Leading Provider of Digital Services for the Manufacturing Industry

Beta is a Finnish hardware company with over 500 employees that has been selling machinery since it was founded in 1901. For a long time, Beta was one of the leading providers of customized and bespoke manufacturing equipment. Its reputation for delivering top-quality machinery allowed the company to sell its products at top prices. Global clients from industries such as aerospace, automobile, and manufacturing largely understood the value of paying high prices in exchange for outstanding quality. In response to evolving technology, however, Beta embarked on a transformation involving substantive changes in how the organization created value. Beta sought to transform itself from a hardware supplier to a digital service supplier, which required a DT to implement a new revenue model, redesign its departmental structure, and change its organizational practices.

### 4.2.1 Technological Change: Challenge and Opportunity

The root cause of Beta's decision to fundamentally alter how it created value was the emergence of software and sensor-based technologies. These technologies enabled much smaller software companies to enter into Beta's core market by augmenting off-the-shelf hardware with software, and also enabled such companies to collaborate with industrial players by offering "smart machinery" with a much smaller inventory than Beta. The first indication of the significance of this issue occurred when Beta lost a major bid to a software company in North America, an event that heightened concerns about Beta's competitiveness: "Our competitors in the software business, they don't have the workshop and factory downstairs like we do here. They just have programmers and computers and nothing else" (Beta chief information officer). The Beta sales manager echoed this concern: "We are in trouble if we are unable to see and change our business and behavior."

### 4.2.2 Transformation Agenda

To respond to these challenges, Beta's senior management implemented a "digital strategy" to fundamentally alter the nature of the value offered by Beta by redefining the organization as a provider of digital services that catered to manufacturing companies. Beta hired a chief digital officer and instituted a "digital business unit" tasked with rolling out several organization-wide changes. As the new digital unit executive explained: "The [new organizational] structure enables us to run an independent digital business unit meaning that we are also able to sell software to [customers] ... and develop

new stuff that's not related, not tied to our hardware at all."

The purpose of the unit was three-fold: (1) to make hardware and software distinct product categories, (2) to incorporate a data-rich logic into the design and development of hardware, and (3) to move toward selling only software and digital services in the future. In the words of the digital business manager:

*We will have pure software projects [in the future]. No single piece of hardware will be involved. That is what it means ... We could deliver that [software] product with very small sales effort, very small support effort all over the world, with a very low unit price and get money from that. (Beta digital business manager)*

These measures reflected top management's belief that the days of being solely a provider of traditional machinery were nearing an end:

*Doing business in the future means that we need to listen and understand customers' real needs and provide an adequate solution, which may or may not contain hardware. The solution might be solely digital; i.e., contain only software and/or data driven services. (Beta strategy presentation)*

As Beta's revised strategy document explained:

*The future lies in the digitalization of manufacturing ... We will take our customers into a new era with our winning combination of hardware, software, and services. It will deliver competitive advantage as software, robotics, and intelligent automation [to] deliver value at unprecedented scale.*

Beta initially achieved a competitive edge by offering control software that generated data through remote connections. This software was enthusiastically adopted by customers and began to transform how Beta created value since the organization now handled 83% of all customer requests remotely without needing to fly technicians to customers, meaning that those customers could continue production immediately.

Building on this initial success, Beta continued in the same direction by investing in industrial Internet of Things applications, virtual reality services, and promotion of their control software as a standalone product. As the digital unit executive explained: "Whatever [Beta] has done in the past was driven by hardware. That's something which has to change." The strategy document also notes an accompanying change in business models involving "software maintenance, licensing models, and variable pricing as an everyday activity" rather than one-time hardware sales.

#### 4.2.3 Consequences of Beta's Digital Strategy and Impositions on Work Practices

As this shift in how Beta created value began to scale within the organization, more and more staff members were affected. Traditionally, sales personnel were key to Beta's success, as they managed relationships with profitable business customers who purchased machines and maintenance contracts. The control software mentioned above was initially sold as a complement to hardware and was thus part of these deals. While selling the control software as a complement in this way did not require a drastic change to how sales were conducted, once the changes implemented by the new unit began to scale, sales personnel were increasingly being asked to change their work practices.

As Beta moved toward selling services and software only, sales personnel had to move from selling a "product" for a one-off payment to selling subscriptions or pay-per-use services. Indeed, management began to argue that sales personnel should move from being salespeople to consultants. As the marketing director put it, "To take on the ongoing wave of digitalization, [we need to develop] consulting capabilities, especially our sales personnel" and "to start processing and consulting the customer before he even decides or knows what he needs."

As management and Beta's new unit increasingly pushed for new ways to create value, this redefinition of the role of sales personnel became an issue of dispute between sales, management, and Beta's new unit. Sales personnel felt increasingly undermined. From their perspective, traditional ways of selling machinery had earned Beta a profitable position in the hardware market. It was the sales personnel who had built and managed relationships of trust with "key accounts" with whom they would strike major deals sometimes involving hundreds of thousands of euros.

New pricing models and selling software ran counter to this way of doing business, threatening the relevance of expertise in traditional sales. As Beta's sales director explained, "I would say that 99% of our sales personnel have lots of experience in selling machines, but not software or software solutions or digital services. There's a lot to learn." Moreover, precisely because their relationships with customers were based on trust, sales personnel were uncomfortable selling "products" they did not fully understand: "It doesn't fit their way of thinking when you ask them to sell a USB drive that is worth 1 EUR to customers for 100,000 EUR. This doesn't make sense and it looks like a rip-off to them" (Beta sales director). As Beta's digital business director confirmed: "Sales personnel are used to selling physical objects. So, they just can't reorient their system to recognize the value of (selling) invisible software."

Our informants repeatedly stressed that expertise accumulated through selling machinery did not

necessarily transfer to software sales (see Table 2). Sales personnel were accustomed to demonstrating hardware using models, mock-ups, or physical illustrations that are not relevant to software sales. Likewise, the revenue model remained unclear to sales personnel. Although hardware-related maintenance agreements were common, they were skeptical about why software sales required such agreements. Crucially, in many ways, the attitudes of sales personnel reflected that of customers. Beta's customers were mainly interested in machines and often could not see why software would be helpful. The very fact that Beta had previously sold its control software as a hardware complement meant its customers considered software to be an add-on but not the main product.

Cumulatively, changes to customer relationship management and a perceived devaluing of expertise led to substantial problems among sales personnel. Beta's vice president acknowledged: "The most difficult part then—it's not the development of the digital product, it's the sales of the digital products, because we are really a hardware-oriented company, and we have been so in the past." The dilemma was that sales personnel had direct access to customers but were reluctant to sell the products and services that management saw as key to the company's future. Tensions arose, and several sales employees left Beta, noting that the new strategy was incongruent with their skills and expertise. The sales manager, for example, related:

*Currently, the guys are not able to see it and [this] comes from the nature and background of [sales personnel] working in the company for 10-35 years ... The transition for them is most probably even impossible. I have done this before [i.e., sales], so I know what I am talking about.*

In a meeting on this issue, it was observed that "customers want machines to automate their production processes. Therefore, they are interested in buying hardware not software. This makes it difficult to convince them to buy software."

Clearly, in pursuing the organization's DT, Beta's senior management had underestimated the consequences for the sales division. Management had determined that sales personnel should be consultants, but many had "no clue" about how to go about doing that. For example, informants shared that it was unclear to them how sales personnel should act as consultants for customers and whether the consulting would be based purely on software or on a mix of software and hardware. A second problem was that it was unclear what customers really needed because digitally augmented machinery was new to them as well.

#### 4.2.4 Reconciling the Issues

As these challenges mounted over time, the digital business unit responded. It ran a three-day internal training session with the aim of “explaining the possibilities of the different digital products and services that the digital business unit had developed and familiarize sales personnel with them.” Beta also hired external experts to train sales personnel to sell digital products. One employee who attended the training stated: “the biggest mentality change” was for personnel to learn to see subscriptions as “revenue pipe.”

That same individual argued that “the workshop was a two-way learning experience,” as sales personnel challenged a number of assumptions prominent in the digital business unit. For example, they challenged the simplistic assumption that the digital unit would create a “cool digital product” and sales would just get on

board and sell it without any kind of context or support. In contrast, Beta’s innovation manager explained that “when we equipped the sales personnel with educational material about digital products and services, this was positively received and improved how sales engaged with customers.”

Our observations suggest that the workshop was successful in that it led to sales personnel increasingly agreeing to sell digital products and supporting management’s ambition to become a provider of digital services. Nevertheless, this came at a cost since a number of salespersons also left the company and Beta had to hire replacements who were digitally savvy but lacked access to high-end customers. Over time, it emerged that one out of every six employees was a software developer. Table 2 gives an overview of our key findings with representative quotes that highlight the building blocks of our model.

**Table 2. Representative Data from the Analysis**

<b>Technological Change</b> <b>1. Environmental context <i>drives</i> transformation agenda</b> <b>(a) Alpha</b> <ul style="list-style-type: none"> <li>Alpha wishes to live up to the market standard: “We have to achieve level 7 on the Healthcare Information and Management Systems Society (HIMSS) scale, meaning we have to become a paperless hospital” (CEO).</li> <li>The French “Digital Hospital” program was published in 2012. It stated that “the development and the modernization of Information Systems had become a major player in improving patient care.” The strategy focused on the coordination of care and on five functional domains including EMR and IT support for radiology images (Digital Hospital Program, French Healthcare Ministry, 2012, p. 3).</li> <li>“The “Digital Hospital” national program came with important funding for the EMR implementation for several years. Alpha hospital applied for this program” (Doctor / hospital information officer).</li> <li>There is an increasing tendency of patients bringing their radiology images on CD provided by radiologists outside the hospital (Observation notes).</li> </ul> <b>(b) Beta</b> <ul style="list-style-type: none"> <li>Beta faces increasing competition from software companies that compete based on the capabilities of their software while buying cheap hardware from other vendors to accompany the software: “there are these pure software companies that don’t have any, kind of, you know, physical machines [or legacy equipment]” (Chief information officer).</li> <li>Increasing shift in the growth area of Beta’s market: “Where the growth and competition [lies] is in software-based solutions, not [just] the software itself, but products and services that it enables. ... Of course, the challenge is that for the last eight years, there have come new players in this area. So, competition is getting tougher. In that sense, even though the market is growing, it is getting more and more difficult to grow or get that market growth. Of course, then one place where we are looking for growth is currently [in] the software products that we have” (Service manager).</li> <li>The rise of new digital innovations such as the Internet of Things (IoT or Industry 4.0) brought pressing awareness of the opportunities and threats of IoT to their current business: “I think we need to take Industry 4.0 [IoT] seriously and search for the opportunities it offers as well as threats it represents” (CEO, blog comment).</li> <li>“After going through the Industry 4.0 [IoT] final report I think it would make sense to join this train” (Vice president, blog comment).</li> </ul>	
<b>2. Organizational context <i>drives</i> transformation agenda</b> <b>(a) Alpha</b> <ul style="list-style-type: none"> <li>Before EMR, radiology images were brought in an X-ray format and kept in the paper patient files by secretaries. Gradually, patients began bringing their radiology images on CD; hence, it was not possible to have them in paper format and to keep them in the patient files (Observation notes).</li> <li>“Initially, the radiology technician uploaded all the radiology images” (Secretary).</li> <li>“Doctors from various specialties need to be able to access patient records including radiology images for patients with chronic conditions. We [doctors] use to go to each department to access the patient’s paper file.” (Doctor / hospital information officer).</li> <li>“Some departments use only paper, some use their specific software, some use paper and software” (Doctor / hospital information officer).</li> </ul> <b>(b) Beta</b>	



- Internal search for growth potential among existing products intensifies and draws attention to the existing software that is typically bundled with hardware: “one [area] for growth is that currently the software products that we have are always directly related to the hardware that we are delivering. So, that’s of course one area that we are looking for growth. [We need] to be able to provide our software as products to this industry that we work in” (Service and maintenance director).
- After a period of declining revenue, Beta employed a new CEO who made digitalization one of his key mandates: “DIGITALIZATION of manufacturing is the cornerstone of growth” (Strategy document).
- The existing digital capabilities of Beta and the good reception of its control software gives it a footing for embarking on a digital transformation journey: “I think that part of the competitive advantage, at the moment, that comes from [Beta] is the [control software and] connection to the different tools, robots and machine tools [at the client’s manufacturing floor]. These are still pretty much not standardized, and there is still some expertise needed to [take advantage of them]” (Chief information officer).
- “the larger emphasis [is] on digitalization. And that is the future! Like I said, if you are not doing it, you’re going to die. If you’re doing it, it depends how well you’re doing it. You’re going to be very happy, or you’re just going to survive” (Marketing manager).

#### Transformation Agenda

### 3. Existing organizational identity *initiates* new identity claim

#### (a) Alpha

- “The project of IS development for 2013-2017 has three objectives: improve patient care, improve IS and hospital management, and improve management of administrative tasks and patient appointments” (Official document: “Hospital’s Strategy for the Information System, 2013-2017”).
- “Administrative departments used to work in silos, but doctors from the medical departments had to coordinate with each other in order to manage more complex paths of patient treatment. Therefore, we [doctors] used to go in every medical department to access parts of the patient file. For cross-functional care, there was no unique patient file” (Doctor / hospital information officer).
- “[Alpha] wishes to arrive at zero paper as soon as possible by applying to the national program. The aim is to digitalize patient records and to keep only one computerized medium” (Official document: “Hospital’s Strategy for the Information System, 2013-2017”). This means that the EMR would be a unique tool for recording, storing, and sharing patients’ data.
- “Maintaining two systems (paper and computer) is very costly, demotivating, counterproductive, and a risk generator. Therefore, we have committed ourselves to the zero-paper strategy” (Official document: “Hospital’s Strategy for the Information System, 2013-2017”). The zero-paper strategy means that all information would be in a digital format only.

#### (b) Beta

- “There will be more projects that are only about software in the future in a really different setting compared to what we have now. We will have projects that are only software, no single piece of hardware involved ... That’s what it means” (Digital director).
- “We will capture the potential of digitalization. [Beta] will play a leading role in this new era of manufacturing.” (strategy document).
- “What is remarkable is that we are having a Digital Business Unit. Right, so, what changes? Actually, this new structure means that we are aligned with the strategy because, in the strategy, it says that digitalization is an essential and central focus of our company” (Digital business manager).
- Beta aims to position itself as a trusted digital partner for the manufacturing industry: “Digital technology and automation set the pace in making manufacturing profitable in any country of the world. Our customers, who compete around the world for markets, talents, and performance, trust in Beta to create innovative [digital] solutions that help them achieve their goals” (Digital director).

#### Transformation Activities

### 4a. Digital technology *supports* value proposition (core value supporting activities)

#### (a) Alpha

- The EMR had to replace paper but also other business IT: “I wanted a fast go live for the new system; if we keep two systems, we can be certain that the old system ‘wins’” (CEO).
- “Senior management wanted to improve performance in all departments by implementing the EMR as a cross-functional software” (Doctor / hospital information officer).
- “The EMR allows us to access and utilize data in real time as part of patient care. Earlier IT-systems could not do that. This is a true organizational revolution, if we consider that health givers had the habit of asynchronous information” (CEO).
- “The aim is to improve the quality and security of patient care by use of one common technology” (Doctor / hospital information officer).
- “The EMR is just the digitalization of the patient’s file. It allows doctors and all health care professionals to access the patient’s file across departments and geographic locations of the hospital, without requiring them to go to every department to access paper files” (Doctor / hospital information officer).

### 4b. Digital technology *(re)defines* value proposition (core value redefining activities)

#### (b) Beta

- Beta’s software products redefine the nature of the value that they now offer to their customers as well as their underlying value creation process: “We used to be machine manufacturers. We had the [product name], a really mechanical product

having control [software] system on the top of it, but now the control [software] system has grown in such scale that it doesn't need the hardware anymore, and it's a completely different sport, it's a different game, and kind of shakes up the way of doing things" (Digital business manager).

- They carried out a massive structural change to the whole organization and instituted a new digital business unit to be the driver of the transformation agenda: "[We are establishing a] new digital unit [to] run an independent digital business and thriving existing business ... [this is] essential for creating a clear, sustainable, and successful [digital] offering ... The ongoing structural change will allow us to utilize all this" (Strategy document).
- In response to the question of how digitalization creates value: "For example, real-time production control; the possibility to make lot-size-one production [i.e., single customized unit as opposed to mass manufacturing] in a cost-efficient way; the possibility to share resources in manufacturing networks; transparency in manufacturing networks. Those are things that we [can now do] that are most probably creating [new] value. And these are all enabled by digitalization" (Unit director).
- "If we consider our previous model, the businesses were kind of set vertically, [while] the software was horizontal over all businesses. Now the software is flipped from the horizontal position to the vertical position alongside the other businesses" (Digital business manager).
- The company leverages IoT to create new types of value propositions that would typically be the domain of software companies: "They [i.e., customers] have certain needs related to life cycle services that require IoT-driven solutions, and that's something we are developing and providing [to] them. ... There will be lots of new data-driven services that will be our own products that are not related to life cycle services at all. So, that's something that we are going to have more and more of in the future. That will be our own business" (Digital director).
- "I mean, when it comes to our software functionalities, there's nobody else who is able to offer something that we have. So, we are able to provide more added value for the customers' processes than anybody else. So, it's unique in that sense. If you want to buy something that is simple and cheap, it's not us" (Marketing manager).
- Then, of course, the value proposition. [For] whatever services or software, we have [to] formulate a key value proposition for the customer, and every item in our own roadmap should have a clearly defined value proposition (Unit director).

#### Imposition and Reconciliation

#### 5. Imposition: Transformation activities *impose* work practices changes

##### (a) Alpha

- "There are different paths on how to upload and index digital images. This makes the whole process error prone" (Secretaries' representative).
- "We have to define clear rules on how to upload and index digital images" (Secretaries' representative).
- Secretaries may work for one or several departments, and there is significant turnover among secretaries. They learn how to perform their tasks on the floor, and there is a big difference between their practices of uploading radiology images and using the EMR depending on their habits (Observation notes).
- "Secretaries have difficulties with downloading patient images directly" (Secretaries' representative).
- "The process is complex and requires experience and expertise because it contains several steps and the patient's ID is sometimes not recorded correctly - or worse, not recorded at all. Moreover, there are more and more images brought by patients and the secretaries are not sure how to deal with those" (Secretaries' representative).
- "Secretaries are overloaded especially in some departments" (Secretaries' representative).
- "Secretaries want to continue using paper. It demands fewer steps" (Secretaries' representative).
- "The Picture Archiving and Communication System (PACS) is slow in the afternoon. We were told that we could not work because too many people tried to access the server. We were told to do something else in the meanwhile and then return to the task at a later point in time" (Secretary).
- "Uploading digital images is cumbersome due to bugs and the systems being slow" (Secretary).
- "It's necessary to investigate how to formalize this task. But it's also necessary to resolve the differences in the secretaries' practices" (Doctor / hospital information officer).

##### (b) Beta

- "Sales personnel are used to selling physical objects. So, they just can't reorient their system to recognize the value of (selling) invisible software" (Digital business manager).
- A number of employees quit the company as they considered the change in the direction of the company to be in misalignment with their competence or the prior identity that they could relate to (Observation notes).
- Similarly, a large number of new employees were hired, which implies a huge change in the composition of the workforce that sets in motion a state of continuous flux as they try to define new and re-established work practices that reflect the new value creation and value delivery activities required for the transformation (Observation notes).
- The salespersons were asked to act as consultants and do what is called "consultative sales" in order to sell the new digital products; however, this was outside their traditional role or work practices: "But if we are discussing about, for example, consultative sales, it's very difficult to tell somebody else [i.e., the salesperson] what to tell to the customer, because that [has] not [been] their job previously" (Marketing manager).
- Shifting expectations toward the revenue model: "We aim at using new pricing models. There has to be new pricing models for sales because our current pricing relies on fixed prices. It doesn't work if we talk about software deliveries, software products, etc." (Digital business manager).

**6. Reconciliation: Reconciliation actions *refine* transformation activities****(a) Alpha**

- “We need to seek different solutions. For example, can we use a new software that automates indexing and uploading in order to decrease the time that these tasks take?” (Secretaries’ representative).
- “We need to verify whether the additional time results from technical problems or lack of skills and competencies” (Doctor / hospital information officer).
- “It’s necessary to put a better analysis in place to formalize this task. But it’s also necessary to resolve the differences in the secretaries’ practices” (Doctor / hospital information officer).
- “So, secretaries will upload the index images in the departments that are very busy while in other departments the radio technicians will be responsible for this task” (Doctor / hospital information officer).
- “We will write a tutorial on how to perform the process” (Quality manager).

**(b) Beta**

- Bullet points on how to develop HR: “[We will establish] a trainee program ‘Nurturing Future Specialist’; [we will establish] a leadership development program encouraging ambition-and result-oriented work” (Strategy document).
- “We have a lot of responsibilities also regarding teaching the sales organizations how to deal with [digital offerings], how to sell software, and how to sell new kind of products” (Digital director).
- “[Reorganizing the company with a digital business unit] was done for a very practical reason, definitely. With our products and with the employee know-how that we have and with the market potential, this equation provides faster growth with better revenue than we were able to deliver, meaning that we needed to shake the teams up a bit to have a wake-up call” (Software development manager).
- Reducing uncertainty surrounding institutional structures: “In some countries, it’s hard to sell and to offer digital products. So, I think we need some kind of, let’s say, market research and analysis to really convince and figure out the right offering for our customers” (Marketing director).

## 5 Discussion

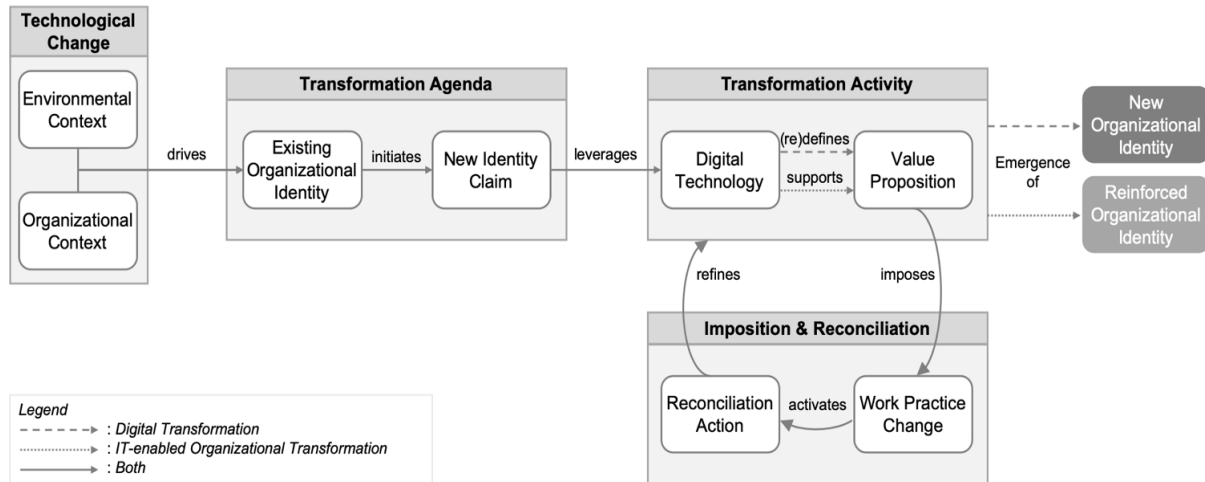
This paper seeks to disentangle the conceptual differences between DT and ITOT and to unpack how the development of these processes unfold over time. To achieve these aims, we studied the transformation processes in two organizations, Alpha and Beta, to reveal differences in terms of transformation agenda, transformation activities, the impositions that these activities created, and the reconciliation actions that resolved these impositions. In the next section, we synthesize these insights into a process model and discuss contributions, practical implications, limitations, and future research.

### 5.1 Conceptualizing Similarities and Differences between ITOT and DT

Drawing on our case study insights, we theorized the similarities and differences between ITOT and DT in a conceptual model (see Figure 1). We were inspired by earlier work that highlighted the importance of integrating digital technology into one’s value proposition (Barrett et al., 2015; Günther et al., 2017; Huang et al., 2017) and that positioned digital technology within a central role for transforming work

(Barley, 1986, 1990; Barrett & Walsham, 1999). Whereas the outer boxes of our model depict generic elements of transformation processes (at the macrolevel of the organization), the inner boxes depict the inner workings (microlevel). The dotted arrows highlight the core differences between ITOT and DT. The two transformation processes differ according to the patterns by which the dynamics in value propositions relate to dynamics in organizational identity: technology can either (re)define (DT) or support (ITOT) value propositions, implying either the emergence of a new organizational identity (DT) or the reinforcement of an existing organizational identity (ITOT).

Our evidence reveals that both transformations are driven by the influence of the prevailing environmental and organizational contexts (Pettigrew 1987). The core similarity is that technological change in the environmental and organizational context drives the existing identity of the organization. Technological change can either be viewed as a source of digital threat or a source of digital opportunity that then jump-starts DT or ITOT processes (Sebastian et al., 2017; Utesheva, Simpson, & Cercez-Kecmanovic, 2016). However, our empirical analysis indicated a possible difference in the technological changes that drive the emergence of DT or ITOT, respectively.



**Figure 1. Process Model of Transformation**

For example, we observed that sensor-based technologies had a decisive impact on the Finnish manufacturing company Beta, which experienced pressure exerted by competitors to augment its physical machines with digital capabilities. This push transformed Beta's perception of itself into that of a "digital service provider" rather than a hardware company. Likewise, driven by the ambition to become more efficient and patient-centered, the French hospital Alpha adopted digital technology to achieve these aims. The goals of both Alpha and Beta are indicative of the different ways that environmental and organizational contexts can drive an organization to embark on a transformation journey.

Building on our observations, we propose that the transformation agendas that underlie DT and ITOT lead to different dynamics of how value propositions and organizational identity interrelate (Albert & Whetten, 1985; Ravasi & Schultz, 2006). For example, Beta's intention to become a "digital service provider" and redefine its existing identity as a hardware company demonstrates how Beta leveraged digital technology to initiate a fundamental change in the firm's value proposition. This correlated with a renewed identity claim (Ravasi & Schultz, 2006); since Beta's management wanted the organization itself to become a "trusted digital partner," they formed a new unit tasked with reorganizing Beta's core value-creating activities around digital offerings. Management thus gravitated toward a much different value proposition, identity, and core value-creating activities.

In contrast, Alpha's intention to initiate activities to become a "more digital" hospital echoes the goals of many other organizations—namely, to become more efficient, better, and, perhaps, "more digital," while maintaining the structure of their core value-creating

activities (Berente et al., 2016; Gregory et al., 2015). Like Alpha, organizations undergoing ITOT continue to enact their existing value propositions but seek support from digital technology through, for example, increased efficiency. Given this intent, technology reinforces the existing identity of the organization but does not transform it. The transformation agenda in these contexts thus seeks to make work more efficient, effective, or "digital" but such an agenda draws from identity claims and value propositions that, in general, remain the same. Nevertheless, both Alpha and Beta leveraged digital technology to achieve the new identity claim of being "digital."

Our evidence revealed a fundamental conceptual difference between DT and ITOT in terms of their transformation activities, particularly regarding the role of digital technology for formulating and executing value propositions. Our observations correspond to earlier research that highlights the importance of value propositions for selling digital products (Barrett et al., 2015; Porter & Heppelmann, 2015) and demonstrates that organizations adopt digital technology in order to become better at what they do (Besson & Rowe, 2012; Lyytinen & Newman, 2008). Whereas, in the Beta case, the technology was paramount for (re)defining a new value proposition, given that the organization sought to become a digital service provider, in the Alpha case, technology supported the existing value proposition. The key difference here is that for DT (Beta), digital technology was used to redefine what value means in that context—i.e., it created a fundamental change in the conception of the value offered by that company. This is evidenced in the company's shift from being a seller of manufacturing equipment to becoming a provider of software and IoT services for the manufacturing industry.



In contrast, for ITOT (Alpha), the EMR technology was essential in supporting the hospital in fundamentally improving its existing value proposition. Unlike Beta, Alpha maintained its original identity—a hospital that delivered health care to patients, albeit now in a “more digital” way than before. In other words, the conception of value that Alpha offers remained the same even though their approach to creating, capturing, and delivering that value was transformed by digital technology. In essence, both cases leveraged digital technology in their transformation activities; however, the DT case went a step further by using digital technology to redefine their conception of the value offered by the firm. How digital technology affected the organizations’ value propositions thus differed between the two cases: in one case (Beta), it defined a novel value proposition; in the other case (Alpha), it supported an existing value proposition.

Our cases reveal that defining technology as central to the value proposition is consequential for organizational identity because it sets into motion identity-related dynamics that differ between DT and ITOT. A value proposition can be seen as deeply related to an organization’s identity in that it involves a definition of what an organization is and how it creates value for its customers (Teece, 2010). This closely corresponds to the literature on organizational identity that captures how an organization perceives itself and what it does (Corley & Gioia, 2004; Gioia et al., 2010; Nag et al., 2007). Yet, while the literature on value propositions has typically focused on the strategic orientation of the organization only, the literature on organizational identity enables connecting strategic decisions, such as changes in value propositions and reactions of workers on the “ground floor” to such decisions (Nag et al., 2007; Ravasi & Schultz, 2006). This enabled us to theorize the link between transformation activities and impositions as well as the subsequent reconciliation actions they generated.

The recognition of impositions and reconciliations that occur during the transformation process highlights that transformation activities impose changes on the work practices of organizational members, which, if not attended to, may derail the entire transformation agenda. These impositions on work practices then activate reconciliation actions that subsequently refine the transformation activities. Our empirical evidence shows that changes in an organization’s value proposition and identity claims often lead to changes in the microlevel work in which organizational members engage. Indeed, the transformative effects of technology on work echoes the classical discourse in the literature. For example, Barley (1986) concluded that technology alters work through showing how CT scanners changed the way that radiologists interacted

with technicians because the scanners required technical knowledge in order for them to interpret an image. Digital technology thus became an enabler of role changes since it initiated novel interaction patterns that became institutionalized over time (Barley, 1990). Likewise, Barrett and Walsham (1999) show how digital technology altered identities of reinsurance traders in London (see also, Orlikowski, 1996).

Our evidence is consistent with these findings in that each case reveals that managerial decisions imposed changes on organizational members and their work. For example, at Beta, sales personnel had to learn how to deal with marketing products with digital capabilities. At Alpha, secretaries had to learn how to use new technology to support their work. However, our evidence also foregrounds a more fundamental question that involves “what” work is transformed. When addressing this question, we did not find a single answer; rather, we found that our two cases differed on this matter and that our study extended earlier conceptualizations.

Beta formed a new unit that was intended to reorganize the whole organization so that it could effectively compete by selling digitally augmented machinery. Revenue models, product offerings, and sales practices were envisioned to fundamentally change the entire organization, with digital technology being at the core of this change. At Alpha, the hospital implemented digital technology in order to become more efficient and patient centered. However, basic operational models underlying patient treatments remained intact, as did the roles of key personnel such as doctors. Rather than transforming the work of medical providers, Alpha’s transformation affected administrative work and catered to the hospital’s core value-creating activities. Thus, whereas current research has generally suggested that digital technology transforms work, our evidence points out that we need to ask more carefully about “what” work is being transformed. According to our findings, DT is much more about transforming work around the core *value-defining* activities of an organization, whereas ITOT relates more to transforming work around core *value-supporting* activities.

The reconciliation actions activated in response to impositions on work practices represent emergent efforts that are galvanized to refine transformation activities. Transformation in the area of core value (re)defining or supporting activities is challenging partially because the prior organizational identity embeds work practices that are affected (Nag et al., 2007). This is consequential for transformation activities and their progress. For example, Beta’s identity as a successful hardware provider endowed sales personnel with a role identity that was central to the success of the organization. Likewise, Alpha’s identity as a public hospital instructed secretaries to

work according to a highly formalized order, which, however, lacked instructions on how to manage digital imaging. Thus, both cases suggest that their transformation activities diverged from the work practices promoted by Alpha's and Beta's transformation agendas.

At Beta, digital technology was at the core of these activities, which called into question the existing work practices of salespeople—i.e., their metrics of success, their knowledge of how to sell products, and their power relationships within the new unit that was formed to help them learn how to capitalize on digital products. The Alpha case indicated a similar dynamic in the work practices of secretaries. Secretaries lacked knowledge and formalized prescriptions for how to manage digital imaging, which set into motion organizational learning processes that increasingly enabled secretaries to use the EMR technology. Hence, even though there seemed to be distinct differences in what areas of an organization are transformed, our evidence suggests that what DT and ITOT have in common is that they require organizational members to adapt to changes in work practices imposed by transformation activities (Besson & Rowe, 2012; Lyytinen & Newman, 2008; Silva & Hirschheim, 2007). Furthermore, we found a commonality in the recalibration of the transformation activities to respond to the emerging mismatch in the envisioned value propositions, identity claims, and the instituted work practices (Barley, 1986, 1990; Barrett & Walsham, 1999; Nag et al., 2007).

One of the key conceptual delineations between DT and ITOT lies in the outcome of the process. While the outcome of a DT process is the emergence of a “new organizational identity,” the outcome of an ITOT is the emergence of a “reinforced organizational identity.” For example, Beta ultimately gravitated toward sales practices that were aligned with the new identity claim promoted by top management. This novel identity claim thus became increasingly shared among the different organizational members as the reconciliation of work practice changes were incorporated into the transformation activities. This gradually paved the way for new digital-oriented value propositions, indicating that Beta was becoming a much different company than it was before.

In contrast, the work of Alpha's secretaries also increasingly converged with the new identity claim promoted by the hospital; however, because this claim did not fundamentally differ from Alpha's original identity as a hospital, the convergence of the transformation activities with the identity claim did not lead to a new identity. Instead, it reinforced the existing value proposition, as well as Alpha's identity as a university hospital. In effect, at both Alpha and Beta, the reconciliation of the transformation activities that aligned or resolved the impositions on work practices

effectively led to a transformed organization. The difference however was that DT led to an identity metamorphosis at Beta, whereas ITOT reinforced an existing identity at Alpha.

In summary, we propose that DT and ITOT can be conceptually delineated in two ways:

- **Transformation activities:** For DT, digital technology (re)defines the value proposition; for ITOT, digital technology supports the value proposition.
- **Transformation outcome:** DT is characterized by the emergence of a new organizational identity, while ITOT is characterized by the emergence of a reinforced organizational identity.

Despite these differences, our study indicates that both transformations share the fundamental building blocks of transformation. However, the patterns of their interrelation enabled us to better understand the difference between the DT and ITOT. We posit that conceptual delineation is essential if we are to take the concept of DT seriously in our future theorizing. Importantly, such clarification can help steer researchers away from the trap of “comparing apples and oranges” in future empirical and conceptual scholarship.

## 5.2 Rethinking the Logic by Which We Discuss DT

Thus far, at an organizational level, scholarly discourse around DT has largely followed the same logic as traditional ITOT discourse; that is, technology has been addressed as strategically relevant for improving business outcomes. A problematic consequence is that we, as a field, risk making “digital” a buzzword that becomes attached to multiple phenomena, akin to using digital “x” in order to make something sound more interesting (Baiyere, Grover et al., 2017), even though our community increasingly recognizes that “digital,” as a concept, requires a new logic of thinking about technology (Baiyere et al., 2019, 2020; Baskerville et al., 2019). Yoo and colleagues (2013, 2010) specifically suggest that the material properties of digital technologies call for reconsidering classical models of transformation, a call that corresponds with differentiating between IT strategy and business strategy (Bharadwaj et al., 2013), innovation management and digital innovation management (Nambisan et al., 2017), and entrepreneurship and digital entrepreneurship (Davidson & Vaast, 2010; Nambisan, 2017).

These studies have pointed out that the role of digital technologies require new ways of conceptualizing their organizational consequences. However, extant work on DT has revealed that it has been conceptualized in

essentially the same ways as ITOT. For example, Vial's (2019) comprehensive review and framework of DT has drawn on a body of work that builds on a logic of argumentation familiar from ITOT research, making it difficult if not impossible to spot conceptual differences between these two types of transformations (Besson & Rowe, 2012; Vial, 2019). Both are cast as strategic changes that build on IT in order to improve performance, and this makes it hard to understand why we as a field should consider DT and its widely proclaimed novelty.

We believe that a better understanding of DT calls for altering the logic with which we think about this topic. Particularly, because researchers have addressed DT using the same underlying logic as ITOT, we argue for abandoning two ways in which DT has been conceptualized. One is to move beyond thinking about DT only in terms of its strategic significance. This way of thinking is evident already in Henderson and Venkatraman's (1992, 1999) work on strategic alignment and also characterizes most of the current literature on DT (e.g., Vial, 2019). Both streams argue that digital technology calls for some sort of strategic action that aims at improving or sustaining business outcomes. However, continuing in this direction is unlikely to yield conceptual progress since all transformation initiatives normally aim at improving business outcomes. Therefore, the strategic significance of ITOT and DT will always be high, and thus, the associated strategic change processes will likely resemble each other (Besson & Rowe, 2012; Vial, 2019).

Unless we move beyond a solely strategic perspective and acknowledge the interplay between strategic and other viewpoints (e.g., the organizational lens), we are unlikely to make much progress in understanding what is new about DT (see also Baiyere et al., 2020; Hinings et al., 2018). To be clear, we are not suggesting that strategy does not matter for DT; rather, we argue that looking at DT from a strategic stance alone makes it hard to understand how DT differs from ITOT. In our study, the understanding that there is a distinction in how the interplay between digital technologies and value propositions unfolds is only made possible through unpacking the operational and strategic processes within the two transformations. Such insights would be difficult to glean by adopting a unidimensional strategic perspective.

Our second proposal to alter the way we think about DT is to move beyond solely macroviews that apply predominantly to the organization as a whole. Recent review articles on ITOT (Besson & Rowe, 2012) and DT (Vial, 2019) reveal that conceptualizing the latter at the organizational level is likely to lead to theoretical arguments that resemble key topics of the ITOT debate; that is, organizations are required to react to technological changes while dealing with internal

challenges. Similar to our first proposal, our empirical analysis and the process model led to the development a multilevel view of the underlying process of transformation. By taking this view, we were able to achieve a conceptual untangling of DT and ITOT, both at the microlevel (inner boxes in our model) and the macrolevel (outer boxes in our model). This perspective enabled us to observe and propose differences between DT and ITOT transformation in terms of both the outcome (i.e., new/reinforced identity) at the macrolevel and activities (i.e., digital technology (re)defines/supports value propositions) at the microlevel.

Against this backdrop, we suggest two ways of unpacking the differences between DT and ITOT. The first is to overcome the dominant focus on strategic significance at the expense of other viewpoints by looking at the organizational consequences of the strategic decisions that are involved in either type of transformation process. Thus, while strategy clearly matters, we move the conceptual spotlight toward the interaction between strategic choices and operational actions that underpin an organization's transformation. Secondly, in addressing organizational consequences, we call for a multilevel approach that explores the differences between DT and ITOT from the vantage point of how such processes affect organizational members differently.

### **5.3 Theoretical Contributions**

We offer two contributions to theory. First and foremost, we have disentangled the conceptual differences between DT and ITOT. This is important because the former has largely been conceptualized in the same ways as the latter (Bohnsack et al., 2018; Kutzner, Schoormann, & Knackstedt, 2018; Li et al., 2017; Lucas Jr. et al., 2013; Vial, 2019) despite calls to unpack its conceptual specificities (Yoo, 2013; Yoo et al., 2010). Based on our study, we have shown that DT and ITOT indeed have several similarities; however, we have also shown that they differ in terms of their key activities and outcomes. DT involves using digital technology in order to (re)define a value proposition and to change the identity of the firm, whereas ITOT involves using digital technology to support an existing value proposition and reinforce an existing organizational identity. We were able to identify this distinction because we considered transformation in terms of how it involves changes in the ways that organizations think about themselves and how they leverage digital technology to change their identity (Albert & Whetten, 1985; Ravasi & Schultz, 2006). This brought to the fore the important consequences that arise when value propositions are (re)defined by digital technology that alters the identity of an organization (DT) versus digital technology implemented within the bounds of an existing identity (ITOT).

Our second contribution is our revelation of how DT develops over time. Even though the phrase “going digital” (Halamka, 2015) suggests that longitudinal dynamics are important, we understand little about how DT unfolds over time (see also Besson & Rowe, 2012). This issue is particularly crucial for DT because it has been scarcely developed as a concept. Instead, the literature on the matter is largely practitioner-oriented and relates to the power of executives to transform organizations (e.g., Singh & Hess, 2017). While we acknowledge that executive actions matter (Dremel et al., 2017), heralding executives as heroic change agents is problematic (Mintzberg & Waters, 1985; Pettigrew, 1987) because it ignores the fact that changes in work practices can alter the trajectory of planned transformation activities. In terms of DT, we found that identity claims expressed by top management lead to impositions and reconciliations, the interplay of which explains the outcome of DT as a new organizational identity. This puts into perspective the literature that considers DT as radical change (Matt et al., 2015; Sebastian et al., 2017; Westerman, 2016) but does not address the longitudinal dynamics or challenges occurring during the transformation journey.

## 5.4 Implications for Practice

Through clarifying the differences between DT and ITOT, our study assists managers in anticipating what challenges may arise during their attempts to transform organizations. Regardless of whether their transformation agenda leverages digital technology to reinforce or change their value proposition and identity, it is likely that they will encounter obstacles firmly rooted in work practices. These work practice impositions have considerable implications for budgeting and organizing the transformation. This is demonstrated, for example, by the sales personnel at Beta who had to let go of their extensive and hard-earned knowledge about selling hardware while taking on the task of learning the skills required for selling and consulting on intangible software products and services.

Our study findings also indicate that managers should critically assess the role that digital technology plays in transformation. A key consideration would be to assess whether digital technology is being leveraged to define the conception of value that the company offers or to support or even enhance existing value propositions. In other words, managers should assess whether digital technology is considered key in (re)defining or supporting an organization’s value propositions or whether it demands a fundamental change in the organization’s identity. An understanding of the role of digital technology for a transformation could be useful in helping managers contextualize digital technology within their chosen transformation agenda.

## 5.5 Limitations and Future Research

Even though our study offers significant insights regarding the conceptualization of transformation, it is not without limitations. First, given that we aimed at developing theory but not testing it, future work is needed to ensure that our findings can be further generalized (Lee & Baskerville, 2003). This study was devoted to analytical generalization and, hence, attempted to chart theoretical territory that future work will no doubt need to verify, revise, and advance. For example, it will be important to test the conditions under which either DT or ITOT emerges as described here. Secondly, because our intent was to differentiate DT and ITOT, we separated them conceptually, which is not to say that they could not overlap. For example, DT could comprise ITOT when a company changes not only its IT use but also transforms its value propositions and identity. Future research is needed to more elaborately show how such transformation processes unfold and, especially, how value propositions and identity-related dynamics interrelate during such transformations.

Also, since our process model was based on observations of our empirical evidence, we conceptualized the transformation processes around the key distinctive features of DT and ITOT. However, we recognize that there might be more substantial differences in other elements of our process model. For example, although we highlighted the nuanced differences in the environmental and organizational context that drove the transformation agenda that set both transformations in motion, we refrained from making categorical claims about this. Similarly, although we identified nuanced differences between work practice impositions and reconciliations in both cases (e.g., identity and learning), we were unable to make generalized statements because we focused on only one role within the organizations. We acknowledge the limitation of our data in these respects and, rather than overreach what is afforded by our empirical evidence, we propose that unpacking the interaction between each element of both transformation processes is a worthy area of future research.

## 6 Concluding Remarks

With transformation all around us, it becomes important to have a better understanding of it. We have made progress here by disentangling DT and ITOT based on how value propositions and organizational identity interrelate in these processes. This recalibrates extant discussions about the important cornerstones of transformation by highlighting how organizations think about what they want to be and the interplay between digital technology and their value propositions. While much remains to be done in both



practical and theoretical terms, this understanding enables us to rethink how we, as IS scholars, approach transformation processes, particularly digital transformation.

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