Mahlert & Gersch, 2024
Volume 12, pages 1 – 18

Journal of Competences, Strategy & Management | www.jcsm-journal.de

Exploring Organizational 'ImperfAction': Understanding Practice Changes and Tensions in the Course of Digital Transformation

Natalie Mahlert & Martin Gersch
Free University of Berlin, Berlin, Germany
Contact: natalie.mahlert@fu-berlin.de | DOI: 10.25437/jcsm-vol12-101

Abstract: *Digital transformation (DT) is accompanied by profound changes to organizations, including shifts in strategy, technology, processes and culture (Vial, 2019). This prompts a reassessment of established practices and the emergence of new or modified practices, which in turn drives DT. Current research emphasizes the role of tensions as catalysts for organizational practice changes (Orlikowski & Scott, 2021). However, we lack a nuanced understanding of these practice alterations and its driving forces within DT. Drawing on practice theory and tensions, we ask: How does Digital Transformation changes organizational practices, and what are the specific driving forces influencing these changes? Based on a qualitative interview pre-study and an in-depth case study, we introduce 'ImperfAction', signifying how performative imperfections drive practice changes during DT. We enrich the discourse on DT by shedding light on the nuanced roles that tensions and 'ImperfAction' play in reconfiguring organizational practices, thereby advancing our understanding of the multifaceted nature of DT.*

Keywords: Digital transformation, organizational change, practices, tensions, imperfAction.

1. Introduction

Digital transformation (DT) has gained significant attention in the fields of information systems research (ISR) as well as management and organization science (Riasonow, 2019). The extensive literature on DT has produced numerous definitions and interpretations (Vial, 2019; Wessel et al., 2021). In this paper, we define DT as "a longitudinal process of fundamental changes in technology stacks, cognitive framings as well as observable everyday (data-driven) practices" (Gersch & Wessel, 2023: p. C19S1)." These fundamental changes are driven by advanced technologies like data-generating sensors, mobile and cloud computing, big data, and artificial intelligence (Gersch & Wessel, 2023). This perspective highlights the dynamic nature of DT, recognising its evolution over time and its continual "flux of change" (Wessel et al., 2021). Hence, changes are an 'emergent phenomenon' of DT (Vial, 2019: p. 17).

With regard to organizations, DT entails significant changes through the integration of digital technologies, leading to shifts in strategy, technology, processes and culture (Vial, 2019). These shifts involve a fundamental rethinking of organizational structures, strategic directions, value propositions, and business models (Vial, 2019; Wessel et al., 2021). As organizations embark on DT and evolve their "form of organizing: [meaning] the patterns of action through which work gets done" (Pentland et al., 2022: p. 194), the need to question established practices becomes necessary. DT thus triggers a critical reassessment and modification of organizational practices. As a result, existing practices can change, and new or redefined practices can arise (Gersch & Wessel, 2023; Wessel et al., 2021), which we define as open-ended sets of (re-)actions that temporally evolve and continually generate and transform organizations over time (Giddens, 1984; Schatzki, 2002). As we argue that organizations continually evolve through actions and practices (Feldman & Orlikowski, 2011), we regard practices as a fruitful analytical unit and put them at the core of our work. This perspective on practices differs from the notion of continuity in traditional practice theory where practices are, among others, conceptualized as "routinized types of behavior" (Reckwitz, 2002: p. 249). Rather than treating practices as constant and repetitive, we recognize how digital technology can change them, challenging the traditional view of practice continuity (Seidl & Whittington, 2021). This shift underscores the value of applying practice theory within the context of DT. Our goal is to delve into how organizational practices can change and adapt in the face of DT, highlighting the flexible nature of practices in the digital age. Current research emphasizes the role of

tensions as a potential catalyst for practice changes within organizations (Smith & Lewis, 2022; Orlikowski & Scott, 2021). Drawing on Smith & Lewis (2011: p. 381), tensions can be defined as the locators for “competing demands”. They arise when existing practices no longer hold and need to be redefined (Orlikowski & Scott, 2021). Regarding the DT process, these competing conflicts occur along the inherent DT challenges: processes with intended or unintended consequences for technology and human tasks, the necessity to redefine or adjust organizational and cognitive frameworks, and the emergence of new, digitally enabled practices that require adaptation within organizations (Gersch & Wessel, 2023). Although prior studies observed the relation between practice changes and tensions (Orlikowski & Scott, 2021; Gesch & Wessel, 2023), there remains a notable gap in our understanding of the underlying driving forces through which practices can change during the DT process (Pelletier & Raymond, 2020). Until now, we do not fully understand the interplay between tensions and practices, and how practice variances arise, develop, and unfold over time in the context of DT (Helfat & Martin, 2015). However, understanding these practice variances and their emergence in the context of DT is crucial to organizations, enabling them to respond effectively to changing market conditions and to develop and integrate digital solutions (Weber & Elz, 2022).

To bridge this gap, our paper explores the driving forces for practice changes within DT initiatives and seeks to answer the research question: How does Digital Transformation changes organizational practices, and what are the specific driving forces influencing these changes? By drawing on practice theory and the concept on tensions, we seek to better understand practice changes during the DT process. To answer our research question, we apply a two-stage approach: a pre-study of digital startups and an in-depth case study of a DT project between a digital tech startup and an established organization. The study begins with a qualitative pre-study among startups to grasp initial changes in practices due to DT. Through semi-structured interviews, we identified an additional driving force – imperfect conditions – that, besides tensions, can reshape established practices. Through their performative power, imperfect conditions can transform into actions, a phenomenon which we term ‘imperfAction'. To better understand ‘imperfAction' and tensions, we selected an appropriate DT case for an in-depth analysis of practice changes and its driving forces. Our research context is anchored in a specific case – 'AutoTECH,' a German automobile manufacturer, who engaged in a collaborative DT project with 'START,' a digital tech startup from the haptic industry, aiming to bring digital innovation to the car. The case is particularly well-suited for addressing our research question, providing insights into how and why organizational practices changed during the 100-day joint DT project. Our case study deepens our understanding of practice changes during DT and gives evidence for tensions and ‘imperfAction' as driving forces for these changes. By introducing 'ImperfAction' and examining its interaction with tensions, our study advances the conversation around DT and organizational practices. We make a notable contribution by illuminating the complex forces reshaping established practices in the context of DT, offering a more detailed understanding of these transformations of how practices change in response to DT.

2. Theoretical Background

In the following section, we explain the DT phenomenon and delve into two theoretical perspectives: practice theory and the concept of tensions. These theoretical underpinnings provide valuable insights into the DT process by enabling an examination of the interactions between organizational practices, actors, and context.

2.1. Taking a practice turn within Digital Transformation

DT is a multifaceted process that brings profound changes to the macro, meso, and micro levels of analysis (Gersch & Wessel, 2023). Consequently, DT involves alterations in the broader industrial context (macro level), shifts in alliance or ecosystem strategies (meso level), and impacts on individual organizational actors (micro level), who perform new or adapted practices along their ‘DT journey’ (Kane, 2017). Like Soh et al. (2023), we conceptualize DT as a journey with various possible pathways. DT pathways can be defined as the “varied journeys experienced by organizations as they make strategic shift, leveraging digital technology and evolving the organization’s business model” (Soh et al., 2023: p. 1594). The DT journey encompasses transformations in business operations, products, processes, structures, and management concepts, leading to adjustments to value propositions and a potential renewal of business models (Matt et al., 2015; Vial, 2019). A comprehensive DT strategy addressing practical aspects is crucial for an

effective DT process. Drawing on Jarzabkowski & Spee (2009: p. 70), the DT strategy can be defined as a "…situated, socially accomplished activity, while strategizing comprises those actions, interactions and negotiations of multiple actors and the situated practices that they draw upon in accomplishing that activity". When it comes to analyzing DT strategy, Strategy-as-practice (S-as-P) has evolved as a promising theoretical lens (Kohtamäki et al., 2018). S-as-P investigates the ways of doing strategy and involves questions of "…who does it, what they do, how they do it, what they use, and what implications this has for shaping strategy" (Jazabkowski & Spee, 2009: p. 69). Hence, Strategy-as-practice focuses on strategizing activities within broader organizational practices.

Previous research already has investigated DT through a practice-theoretical lens (Chanias et al., 2019). Practice theory allows to explain how agency and structure intersect and mutually shape each other (Giddens, 1984) through a focus on (observable) everyday activities (Nicolini, 2012). Practices are not isolated but rather interconnected and interrelated to other practices or "larger constellations of practices" (Schatzki, 2019) and contexts. This interconnectedness creates the possibility for shifts and practice changes (Seidl & Whittington, 2021). Practices, here defined as evolving, open-ended actions that continually shape organizations (Giddens, 1984; Schatzki, 2002), are pivotal in understanding organizational change in the DT context (Feldman & Orlikowski, 2011) as organizations continually evolve through their ongoing practices (Feldman & Orlikowski, 2011; Hernes, 2014). This 'practice turn' (Schatzki et al., 2001) allows us to understand practices as the core and source of organizational change (Goh & Pentland, 2019). Thus, we see the need to examine the practices alongside the observed DT process which is challenging and questioning existing practices by "triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies" (Vial, 2019: p. 118). As the integration of new technologies and the redefinition of operational processes also impacts daily practices (Wessel et al., 2021), we suggest a practice-based approach (Schatzki et al., 2001) to our investigation of the DT process with its interactions between organizational practices, actors, and its organizational and wider contexts. This includes not only the practices of the individual organizational actor, but also practices of several actors from a team, or an organizational entity (Jarzabkowski & Spee, 2009). Practices can also be observed at a higher level, such as in the alteration of industry-level standards or process norms during DT.

In the DT context, practice theory helps to investigate the ways in which digital technology can change practices. Actors possess the capacity to innovate practices by combining different practices (Sele & Grand, 2016), adapt patterns of practices (Deken et al., 2016), and reconfigure practices. While we regard the actors on the micro-level as the performers of practices, thus, containing a source for practice changes and variations, we argue that practice changes can also originate from multiple levels (Pelletier & Raymond, 2020). As practices are embedded in and shaped by the context, we also see that the digital strategy on innovation ecosystems (meso-level) or the wider context, like changing tech stacks in the course of DT, (macro-level) can foster practice changes (D'Adderio, 2014). Following Pelletier & Raymond (2020), we consider three parameters: 1) the organizational actors who shape the DT process, 2) their emergent practices that manifest the DT process as well as 3) the organizational context, in which the DT practices unfold. In line with Büchner et al. (2022), we view the DT process as a co- constitutive phenomenon, characterized by the interdependent relationship between digital technologies and organizational practices. This implies that changes in technology can lead to changed or new practices. Conversely, changes in practices can influence and determine the way technology is deployed and configured.

2.2. The concept of tensions as an explanatory approach for practice changes

In times of fundamental challenges or crisis– when familiar ways of doing things are significantly changed or questioned –the possibility of shifts and practice changes unfolds (Seidl & Whittington, 2021). Consequently, tensions arise because our usual practices are temporarily questioned (Orlikowski & Scott, 2021). Tensions manifest themselves in the form of visible dilemmas stemming from underlying oppositions, contradictions, or conflicts (Smith & Lewis, 2022). Thus, current literature points out to tensions as the locators for "competing demands" (Smith & Lewis, 2011: p. 381) regarding organizational or technical elements. In the context of DT, newly integrated technological stacks can conflict with established practices of using technology. In some cases, the established practices need to be adjusted to the new technological conditions, whereas in other cases completely new practices arise (Soh et

al., 2023). Thus, tensions, become an inevitable part of the DT process (Orlikowski & Scott, 2021).

Tensions have a long scientific tradition and have taken over from the research on paradoxes (Putnam et al., 2016). According to Smith & Lewis (2022), tensions include both a dialectical and a paradox perspective. We refer to tensions from a dialectical perspective, when two elements which contradict each other (thesis and antithesis) are merged into something new (synthesis) and supersede the former thesis (Bledow et al., 2009). By taking a paradox perspective, we can see elements which are contradictory to each other but simultaneously are connected and persist over time. If these elements are considered isolated from each other they seem logical, “but irrational, inconsistent, and even absurd when juxtaposed” (Smith & Lewis, 2022). Both perspectives highlight the “duality of stability and change” (Farjoun, 2010), whereas tensions are both important drivers for the reproduction and the maintenance of the old—as well as for the transformation and creation of the new (Smith & Lewis, 2022). As paradoxes are extremely rare (Putnam et al., 2016), in this paper, we focus on the literature towards tensions.

Smith and Lewis (2022) classified tensions along four main categories: organizational tensions, performing tensions, learning tensions, and belonging tensions. Organizational tensions arise when different organizational systems are merged, leading to conflicting designs and processes. For instance, organizations may struggle with finding the right balance between differentiation and standardization (Haring et al., 2023). Performing tensions primarily occur when various individuals or groups within an organization pursue different objectives that are essential for collaborative efforts. This might involve a trade-off between improving quality and managing implementation costs (Haring et al., 2023). Learning tensions can emerge during the process of creating new practices by using and sometimes discarding existing ones. This can involve a tension between incorporating external influences and fulfilling internal expectations (Haring et al., 2023). Belonging tensions arise from individuals' identification with competing identities, especially when tasks are shifted or changed beyond established professional boundaries. This may lead to a conflict between interdisciplinary collaboration and preserving professional independence (Haring et al., 2023). These four categories shed light on the diverse sources of tensions within organizations.

The tensions result from practical challenges, making it necessary to adjust, experiment, or introduce new practices to effectively address the challenges of DT. Orlikowski & Scott (2021) distinguish between three different types of tensions which produce and accelerate change: pragmatic, tactical and existential tensions. Pragmatic tensions emerge when established practices encounter practical difficulties during their implementation. In response, adaptations are made to these practices to address the arising challenges. As a result, the established practices get improved. Tactical tensions occur when established practices no longer hold, prompting experiments to discover new ways of using these practices for developing products and services that can be feasibly implemented. When established practices no longer serve a meaningful purpose or do not make sense in the current context, we speak of existential tensions. In response, new practices are adopted, replacing the established ones, and providing new approaches to organizational tasks. The different types of tensions as well as their underlying driving forces for change according to Orlikowski & Scott (2021: p. 4), are presented in table 1. To summarize, tensions can act both as catalysts for change (Schatzki et al., 2001) as well as the “symptoms of change processes”

Table 1: Different types of tensions generating pressure for change according to Orlikowski & Scott (2021: p. 4)

Type of tension	**Conditions producing tensions**	**Changes**
Pragmatic	Existing ways of doing things are strained as established practices encounter practical difficulties in practice	Adaptations modify established practices to address the difficulties arising in practice
Tactical	Existing ways of doing things are interrupted as established practices become infeasible in practice	Experiments repurpose the capacity of established practices for new products and services that are feasible in practice
Existential	Existing ways of doing things are discontinued as established practices no longer make sense in practice	Alternative practices displace established practices, offering novel and different ways of doing things

(Haring et al., 2023: p. 2). They stimulate practice changes, laying the groundwork for practice variations and the introduction of new practices.

Current literature indicates that tensions can serve as a significant key driver and explanation for practice changes (Orlikowski & Scott, 2021). Additionally, there's a viewpoint that emphasizes the role of organizational actors as key drivers for change, as they have the capacity to modify practices, by introducing certain variations that have the potential to yield new versions of those practices (Hernes, 2014). According to Soh et al. (2023), the DT process starts with a strategic shift, giving rise to numerous different actions that may deviate from the traditional practices of the organization. These newly introduced actions subsequently trigger tensions, signifying a shift in the direction of organizational practices. However, we still lack a nuanced understanding of the driving forces for practice changes within the DT context. There remains uncertainty regarding whether tensions are necessary components to initiate practice changes and how precisely the interplay between tensions and practice variations unfolds. In our paper, we seek to delve into practice changes and tensions, exploring their interplay within a specific DT case. Thus, we want to answer our research question of how organizational practices get changed through DT, and which driving forces foster these changes.

3. Methods of analysis

In the methodological section, we outline our empirical approach, which comprises both a pre-study and a subsequent in-depth case study to investigate practice changes and its driving forces during DT.

3.1. Pre-study: a first glimpse at practice changes during Digital Transformation

Our research question ‘How does Digital Transformation changes organizational practices, and what are the specific driving forces that influence these changes?’ comprises two parts: (1) an inquiry of the practice changes through DT and (2) an exploration of the forces driving these changes. To address the first question, we applied a qualitative pre-study aimed at gaining initial insights into practice variations within the context of Digital Transformation. The goal of this pre-study was to capture a preliminary understanding of how practice changes can arise during DT, setting the basis for a more detailed investigation into the factors driving these changes.

To achieve our exploratory objectives, we conducted a qualitative interview study. We carefully selected interview participants based on the following criteria: The interview partner should (a) hold an active role within a DT project, thereby possessing relevant knowledge and first-hand experiences related to the process and the impact on organizational practices and (b) work at an organization, where practice changes are particularly conspicuous and accessible. We searched for DT projects with defined time frames to provide a suitable frame for our investigation. In pursuit of these criteria, we conducted an initial series of five semi-structured interviews with startups. We focused on the startup perspective as this ensured to investigate practice changes at an early stage of the organization, where the likelihood for practice changes was especially high due to their relatively loose practice structures (Weber & Elz, 2022). These practices are likely to change during the DT process, thus bringing new or adapted practices into existence. Consequently, startups proved to be valuable interview partners when investigating the fluid practice changes and their driving forces as associated with DT, thereby meeting criterion (b). The aim was to gather comprehensive insights into the nature of the startups’ DT project and the organizational practice changes.

As an analytical approach, the semi-structured interviews allowed for open ended questions and flexibility during the interview, permitting participants to elaborate on their responses and explore unexpected insights (Yin, 2018). Semi-structured interviews are particularly useful in exploratory research because they allow for the discovery of unexpected themes and patterns, making them well- suited for investigating previously unknown practice changes within the DT process. We conducted qualitative data from five semi-structured expert interviews from 03/2021 - 05/2021 with startups which reported about their DT projects, whereas each DT project can be interpreted as an excerpt of a broader DT process. The DT projects all included a change in technology stacks, cognitive framings as well as observable everyday (data-driven) practices according to our given DT definition. The startups are located in Berlin (Germany) and operate in different industries, including the book sector, automotive sector, real estate, telecommunications and the pharmaceutical sector as to broaden our understanding of practice changes across different industries. This diversity aims to enhance our understanding of the research subject and provide insights that might not be apparent if the

sample was limited to a single industry. We interviewed the startup founders or the heads of Business Development due to their first- hand experience in the DT project, therewith meeting criterion (a). Their expertise and their active role within the DT projects qualified them as suitable interview partners for achieving our research aim. Table 2 provides an overview of the interview participants, detailing their DT project, and the specific industries where the DT projects took place.

The semi-structured interviews were held online, in German language and averaged thirty-four minutes in length. The questions towards the interview partners were prepared in a guideline, which covered the following main question blocks: (a) practice changes during the DT project, (b) objectives and motivations, (c) organizational (processual, structural, cultural) DT effects as well as (d) challenges and tensions in the course of the DT project. The recordings were transcribed to ensure accuracy and facilitate subsequent analysis (Yin, 2018). Next, we identified recurring themes, patterns and relevant statements within the transcripts and assigned codes for categorization. After grouping the codes into broader themes, we captured the key findings and insights for each theme. Finally, we interpreted the content with regard to our research question. In our interviews, we found several examples for specific practice changes within the DT projects. Moreover, we found first hints for the existence of an additional driving force alongside tensions within the DT projects: imperfect conditions. These conditions, although not having the character of a tension, still play a significant role in prompting practice changes. For instance, Startup 5 describes their challenges with limited or incomplete knowledge about customer needs and preferences concerning their DT project outcomes. To address these imperfect conditions, they emphasized the importance of information gathering throughout their development processes: “You have to gather information along the way and build customer relationships and trust (…) That's why we started accepting smaller orders that are also in the product pipeline (…) We then used these smaller cases to generate [digital] use cases" (Startup 5). Here, a perceived lack of customer insights and market credibility provoked practice changes, however, it rather has the character of an imperfect condition than a tension according to Smith & Lewis (2022). Similarly, Startup 2 shared their struggle to identify appropriate DT use cases for their software. This led them to collaborate with a larger corporation, stating: “Working with a large corporation (…) allows us to validate whether what we are doing actually works in the market or within a product”. Startup 2 cites the uncertainty regarding their product-use-case fit as an imperfect condition, which became a catalyst for changing their practices, especially in terms of fostering collaborations. These findings suggest that besides tensions, the DT journey is also influenced by imperfections, which can serve as an underlying or early driving force for practice changes. To investigate these practice changes and their driving forces in detail, we selected a specific DT project for an in-depth case study from the array of startup projects analyzed in our pre-study.

3.2. In-depth case study: A deep dive into practice changes and its driving forces

Building on the findings of our pre-study, we conducted a case study to gain a more comprehensive understanding of how tensions and imperfect conditions may contribute to practice changes within the DT process. The case study methodology is particularly suited for answering "how" questions (Yin, 2018). As our research question is to ask “How does Digital Transformation changes organizational practices”, we regard the interpretative case study to be a fruitful methodological approach (Yin, 2018).

3.2.1 Case selection

Based on the findings from our pre-study, we selected a DT case to gain in-depth insights into the effects of DT on practices (Eisenhardt, 1989). This chosen case focuses on a detailed

Table 2: Overview of interview participants in the pre-study

Startup #	Interview Participants’ role	DT project	Industry
1	Founder and CEO	Online services for libraries	Book sector
2	Founder and CEO	Digital signals in car seats	Automotive sector
3	Founder	AI for housing platform	Real estate
4	Head of Business Development	5G technology solutions	Telecommunications
5	Founder	Web-based chemical simulations	Pharmaceutical sector

analysis of a DT collaboration between a startup from our initial exploration and a well-established organization. This analysis aims to broaden our understanding by combining the perspectives of an emerging startup with that of an established organization. To identify an appropriate case out of the five mentioned DT projects (see table 2), we expanded upon the criteria established during our pre-study. These additional criteria include: (a) The DT project under consideration should be of finite duration, ensuring a well-defined and bounded research context, (b) the case should operate within an industry where DT has triggered fundamental changes, and (c) should offer rich data resources detailing daily practices and tensions along their DT pathways (Soh et al., 2023). To determine which case is best suited for our case study, we employed a systematic approach grounded in qualitative analysis (Yin, 2018). First, we evaluated each interviewee's responses and the characteristics of their respective cases from the pre-study against the outlined criteria. After coding and analyzing the interview data related to each criterion, we assigned scores to each case, using a scale ranging from 1 (limited fulfilment of the criteria) to 10 (substantial fulfilment of the criteria). Cases that scored higher against more criteria were considered more suitable.

To validate the results, we employed a cross-validation approach (Yin, 2018). Each startup was individually scored. Subsequently, we compared and reconciled the scores assigned by both authors. In cases of score disparities, a collaborative re-evaluation process was undertaken to ensure consistency and reliability in the assessment. Finally, we synthesized the results and identified the case that scored highest across the criteria. The DT project involving startup 2 aligns most closely with our research objectives and the desired criteria (n=26), thus ensuring the highest quality and relevance for our study. Subsequently, we conducted an in-depth case study of the DT project between startup 2 and its partner.

3.2.2 Research setting

The chosen case highlights a DT project that took place at an open innovation platform, involving the collaboration between Startup 2 and an established automotive manufacturer. We refer to the automobile manufacturer as to ‘AutoTECH’ to assure anonymity for the analyzed organization. With a workforce exceeding 170,000 employees and a long-standing market presence, ‘AutoTECH’ qualifies as an established organization with predefined structures and practices. As an active player in the automobile industry, ‘AutoTECH’ is deeply embedded in a complex environment where maintaining competitiveness through DT initiatives is crucial. In 2019, ‘AutoTECH’ engaged in a cooperation project at an open innovation platform, which connects tech startups and established organizations with the aim of bringing innovation to the car. To infuse new digital research concepts into their vehicles, 'AutoTECH' closely collaborated with a digital tech startup and software provider in the haptic industry as part of this open innovation project. Together, they created a haptic car seat, the so-called Navigation Car seat, which was able to digitally communicate to the car driver through sensual sensory impulses. The project involves the introduction of new technologies, digital processes, structural changes and cultural shifts on both sides of the partnership, leading to tensions and prompting changes in organizational practices. This makes it a fruitful unit to analyze DT pathways along the joint project. Our objective is to capture both the startup's and the corporate organization's viewpoints to more comprehensively understand practice changes in different organizational contexts.

3.2.3 Data collection and analysis

Our study comprises two primary phases: the initial pre-study interviews, conducted from March 2021 to May 2021, and the comprehensive analysis of the DT case. The project started in September 2019 and ended in December 2019, while the project presentation was dated to February 2020. Following these engagements, we dedicated a period from March 2023 to September 2023 for an in-depth analysis and interpretation of the collected data and findings. Despite challenges such as scheduling conflicts and the unavailability of key personnel that prevented a follow-up interview with startup 2 from our pre-study, we revisited the initial interview with its founder and CEO. This offered valuable insights into the startup’s DT experience with their established partner, highlighting the startup's early organizational and process maturity stages. To deepen our understanding of the DT project, conducted an interview with the program director 'INNO' of the open innovation platform, who played a crucial role in overseeing the project. This decision was driven by the unavailability or reluctance of other project-involved employees from the established organization to participate. 'INNO', with its overview of the project, provided valuable insights that compensated for the lack of direct interviews with other participants. 'INNO' played a critical role in defining the project's structure and

overseeing partner communication, emerged as a key informant, bridging the gap between both sides of the collaborative DT project. Currently advising corporations on forming effective startup partnerships, 'INNO's' extensive knowledge of challenges and tensions within such collaborations proved valuable. The input enabled us to document the DT pathways as experienced by both the startup and the established organization during their project. This enriched our dataset and provided a multifaceted view of the DT project's intricacies, capturing the contrasting experiences of 'START' and 'AutoTECH' through 'INNO's' lens. The selected interviewees, due to their significant involvement and first-hand experiences with project tensions, imperfections, and practice changes, allowed for a deep dive into the nuances of the DT process. Our empirical focus on practices, serves as a fruitful unit of analysis.

The semi-structured interviews were held online and in German language. The data results were triangulated by several data sources and an ongoing validation of research interpretations by the interviewees. Besides the interviews, our collection strategy also extended to various multimedia and textual sources to support data triangulation. These included press releases (18), presentation slides (2), videos (5), podcasts (4), social media posts (from platforms like Instagram and LinkedIn) (5), and website articles (9). Access to these resources was facilitated by the open innovation platform's archive of the DT project involving 'AutoTECH' and 'START' in 2019, offering a robust foundation for illustrating DT pathways according to Soh et al. (2023) to learn about experienced tensions and observed practice shifts during their DT cooperation project. The public presentation of project results on the Open Innovation platform's website granted us access to multimedia resources such as videos and links, providing further insights into the implementation and outcomes of the DT project. By combining interviews with a broad array of secondary sources, we were able to construct a detailed picture of the practices, challenges, and outcomes as experienced by both partners. Interviews provide personal insights into the individual perspectives of participants, while podcasts and website content offer additional contextual information and public presentations of the project. This combination enables us to compare the statements of interviewees with publicly available information, creating a more holistic picture of the DT initiative. Finally, we identified patterns and similarities between 'START' and ‘AutoTECH’, focusing on the manifestation of practices and tensions along the DT project. This process involved identifying tangible and observable practices, as they present a rich unit of analysis for empirical research on organizational changes.

4. Case study: Practice changes and driving forces in a startup-corporate digital transformation project

In 2019, 'AutoTECH' and ‘START’ embarked on a DT initiative at an open innovation platform, which connects tech startups and established organizations, aiming to integrate innovative digital technologies into cars.

4.1. Case study key points

The "Navigation Car Seat" DT project, a collaboration between 'AutoTECH' and 'START', took place over 100 days, focusing on creating a haptic car seat to improve driving via digital feedback. During the DT project, part of 'AutoTECH's digitalization push, ‘AutoTECH’ and ‘START’ developed a haptic car seat designed to enhance the driving experience through digital sensory feedback. The ‘Navigation Car Seat’ achievement is realized by incorporating haptic signals, which instruct the driver for instance, by 'physically' indicating a left turn in 200 meters (START). The communication between the haptic seat and the driver is achieved through the integration of electronic sensors, data processing capabilities, and the transmission of precise digital signals, effectively transforming driver navigation with intuitive haptic cues. This innovation led to the introduction of new technologies and processes, causing shifts in structure and processes at both 'AutoTECH' and 'START'. It challenged existing practices, created tensions, and led to the development of new practices. DT lies at the heart of this collaborative effort, representing a process whereby digital technologies catalyze organizational and societal changes, eliciting corresponding organizational responses reflected in modified practices, processes, and cultural shifts. Through an analysis of this case, we aim to enhance our understanding of the practice changes and its driving forces within the DT process.

4.2. Preparation phase

Prior to starting the project, ‘AutoTECH’ undertook a series of preparatory steps, including structural, processual, strategical and cultural adjustments. Initially, they defined their overall DT vision: "…at the strategic level, [‘AutoTECH’] had expressed the [vision] of creating the car of the future, which actually means the device of

the future." (INNO) Building upon this vision, 'AutoTECH' aligned its central strategic areas: "We need to delve deeper into strategic topics,' which means that digitalization and sustainability are significant themes" (INNO). Subsequently, 'AutoTECH' defined a specific goal, that they intended to realize through the DT project: "Customer Centricity and Operational Excellence" (INNO). Aligned with their pre-defined strategy, "their focus [lays] on use cases in business areas such as product development and user experience" (INNO). This shift in focus, compared to the previous year, prompted a revision of 'AutoTECH's' scouting and research practices, including the analysis of industry trends, screening for startup profiles, and the evaluation of startup teams according to specific criteria ("software-centricity team fit" (INNO)), to align them with the predefined strategy. Thus, we can observe practice changes resulting from the alignment with the new strategy which determined their startup selection and finally led to the cooperation with 'START', a tech startup from the haptic industry.

'AutoTECH's' strategic orientation had a significant impact on their governance structure: "These are the issues we have to deal with, but we cannot deal with them ourselves, so structurally there was this new department in R&D." (INNO). As a preparation for DT projects, 'AutoTECH' has undergone significant transformations regarding their governance structure. They closed their internal innovation lab and entrepreneurship program. Instead, they are now focused on open innovation, collaborating with external startups.: "we no longer build things internally ourselves; we are opening up (…) and collaborate with startups that already have these solutions" (INNO). Structurally, 'AutoTECH' established a new department within R&D to facilitate innovation. On the practice side, new practices arose including increased cooperation practices and communication practices with the open innovation provider. Consequently, in line with their strategy, the management introduced a dedicated DT team within the Research and Development (R&D) department, aiming to empower the initiative with startups and enable achievements "in a fast and new way" (AutoTECH). The newly formed DT team had a specific focus on the open innovation project, startups, and technology. It comprised members from various human resource levels, including operational staff, senior experts/managers, and future technology researchers (INNO). Two employees at the operational level were assigned the key roles of being the main contact persons responsible for coordinating the DT project and representing the startup project within the company:" They are the link within the company and also bear the responsibility for building [the DT project] in such a way that it works." (INNO). This included "to effectively provide the business unit with the right startup (…) and the first person's responsibility is to ensure this, while the second person has the operational task of accompanying the pilot project." (INNO). Consequently, new practices emerged, including scouting practices for identifying suitable startups (resulting in the emergence of a new practice), internal recruiting practices aimed at achieving a more effective corporate-strategy fit, and the internal practice of directly communicating new project ideas to the R&D department (representing a practice change) so "that not every business unit had to approach [the open innovation platform] directly or scout on their own; instead, there is a [dedicated] team" (INNO).

In addition to assuming new responsibilities, such as scouting, the staff restructuring also involved the reallocation of resources and adjustments to the budget allocation (INNO). Regarding budget allocation, 'AutoTECH's management decided that the funding for DT projects would originate from the individual business units rather than the central R&D department. The reasoning behind this decision was to enhance the business units' commitment to a project: "When you pay for something yourself, you tend to have a greater personal interest in its success" (INNO). This approach increased budgetary responsibility for managers, who were now required to finance their own projects, leading to corresponding adjustments in their initial budgeting practices.

In preparation for the DT project, 'AutoTECH' had to undergo significant process adjustments. On the one hand, there was a general necessity to shorten existing processes to ensure that the project could be completed within the predefined three-month timeframe as set by the open innovation provider. An illustrative example is the purchasing process: "When [START], for example, send an invoice, [START] can't just send an invoice directly. Instead, a proof of service must be sent first, and the [established] company has to sign this proof of service. After that, we can forward the proof of service along with the invoice to the procurement department. They settle the payment, and so on" (START). However, this established process takes "one year in average" (INNO) and needed to be adjusted: "They (…) managed to condense the typical one year-long sales process with the supplier into just three weeks. This involved

working closely with the Legal Team, given that they had a Non-Disclosure Agreement (NDA) and a contract in place. Normally, this would have taken a considerable amount of time and represented a significant change. However, it also took one to two years for all these [new] processes to become well- established" (INNO). In the end, 'AutoTECH' introduced shorter decision cycles, which enabled them to move on more quickly: "Working with a startup was refreshingly quick: we just started right away. We didn't have to negotiate long. We had a common sense of what to do and then we just did it." ('AutoTECH')

On the other hand, 'AutoTECH' had to modify its purchasing process with regard to the provision of supplier numbers, in order to facilitate the realization of the collaborative DT project with the startup: The startup describes the challenge that "there's always a lot of bureaucracy involved. Sometimes you can't even talk to people until you have a supplier number. However, we don't fit into a typical supplier questionnaire because we don't supply components for the production of mass-market products, even though it's still relevant for the mass-market products they eventually choose. […]. It's challenging to get a supplier number or be listed in general, to be connected with the right department, and also to ensure that this department has the budget available to fund projects." (START). To address these tensions, the startup was paired with the dedicated contact from the DT team. This contact person internally established connections and paved the way, enabling the startup to navigate through or even bypass the conventional, established processes (START). For instance, this involved "skipping the step of acquiring a supplier number and proceeding directly to drafting an offer" (START). As a result, the operational-level personnel from the R&D department played a supportive role in the joint project by identifying the appropriate contacts within the organization, assisting the startup in circumventing the 'supplier number' process step, thus fasting or skipping process steps that would typically be part of 'AutoTECH's' original purchasing process. This required extensive strategic planning and a significant reconfiguration of the prevalent structures and processes, but in the end: "Working with [the open innovation platform provider] helped me because there are already established processes how to move on quickly and how to move around those usual obstacles you have in the project" ('AutoTECH').

Moreover, cultural barriers played a role during the preparation phase of the DT project. Several 'AutoTECH' employees had concerns about collaborating with a startup, particularly regarding the quality of their work in a short period of time (INNO). Accustomed to the well-established, lengthy processes, they found it challenging to believe that a project with a three-month duration could yield meaningful results. These concerns initially led to resistance towards cooperation. To address this resistance, 'AutoTECH's' management initiated a campaign, in which the Chairman of the Executive Board personally promoted the advantages of tech cooperation projects with startups, thus fostering a startup-friendly attitude among employees (INNO). This effort included adjusting communication practices at the management level and developing campaign planning practices within the marketing department. Furthermore, 'AutoTECH's' management made a strategic decision to integrate early adopters within the organization to cultivate a proactive startup-friendly culture (INNO). Instead of a top-down strategic decision, the management allowed individuals who were initially interested in technology and startups to become involved. These early adopters served as brand ambassadors within the company and drove the DT project forward (INNO). This, again, included adjusted communication practices at the management level as well as the adjustment of processes (communication directly to the DT team in R&D) to facilitate innovation.

On the other side, the startup describes a different concern related to the fear of "simply not surviving the project" (INNO), thus lacking sufficient financial resources if the project takes too long: "However, there's also the significant challenge that if the corporation doesn't move swiftly and takes 1, 2, or even 3 years, the startup may cease to exist in the meantime" (INNO). In sum, the different speed of the project represents an underlying tension between the startup and the established organization.

Conversely, the startup may also fear that the established organization could copy their innovations and solutions, as corporations often have both the resources and the capacity to do so (INNO). This is why "having contracts in place, including NDAs, becomes critically important" (INNO).

4.3. Execution phase

After the initiation of the project, 'AutoTECH' and their startup partner conducted a problem-identification workshop to identify the core driving challenges and issues faced by drivers on the road (START). This workshop incorporated

agile practices as used by ‘START’, which 'AutoTECH' had to adopt. Consequently, 'AutoTECH' underwent a significant transformation towards agility, particularly in terms of project management practices. These changes have cultivated a more dynamic and adaptable organizational culture, empowering them to respond more effectively to the evolving challenges and opportunities within the automotive market.

After the successful prototyping phase, the development of the Navigation Car Seat became the next crucial step for the startup. This phase involved practices for transforming the refined prototypes into functional products that can be integrated into ‘AutoTECH’s’ vehicles. Afterwards, they integrated the necessary electronic components into the seats. This included navigation systems, sensors, software and connectivity hardware. Supplementary to the electronic components, the startup was in the lead to develop the software that powered the Navigation Car Seats. This phase adjusted software implementation practices as well as extensive testing practices to identify and rectify software bugs or glitches. Within this process, ‘AutoTECH’ experienced software using practices as they suddenly involved haptic software and created new user interfaces for its customers.

During the development phase, ‘START’ had the responsibility of ensuring that their solution complied with the regulatory requirements of the automotive industry. This was particularly relevant in areas such as data security and overall safety standards (INNO), as these are critical considerations when developing software solution for the Navigation Car Seat. Insufficient consideration “…or not taking these regulations seriously, can lead to cooperation failures” (INNO), thereby demonstrating a challenge to the startup. To address this challenge, the startup engaged in additional research practices, which became adapted to the automotive market.

4.4. Evaluation phase

Finally, ‘AutoTECH’ launched their interior car solutions at the “EXPO Day” event (START). This phase aimed to showcase the results of 100 days of working and involved presenting and pitching practices that became adapted to the Navigation Car Seat. While pitching practices are common to ‘START’, ‘AutoTECH’ still had to develop their pitching practices in the course of the project. As an aftermath of the project, ‘AutoTECH’s’ involved employees experienced “increased internal visibility” (INNO), which led them to develop and cultivate their own internal networks, fostering connections and touch points within the organization. This changed how employees how employees approached and engaged in networking practices.

For the startup, the validation practices changed, as they started to validate their solutions through cooperations: "Working with a large corporation allows us to validate whether what we are doing actually works in the market or within a product. We also gain access to entirely different resources and budgets needed for ongoing development." (START) This, in turn, professionalized their development practices and allowed for technological solutions, that they could not have reached alone (START). However, they realized through the project that they still search for a different service solution: “in the end, our goal was to create haptic feedback software that anyone could use to build their own haptic projects.” This, in turn, had several implications for their development practices as they stopped focusing on customized haptic solutions, but rather focused on developing "intuitive user-friendly interfaces” (START). Throughout the DT project, 'START' gained a deeper understanding of corporate structures and their peculiarities, which subsequently influenced their pricing strategy. Prior to the project, ‘START’ would “(…) price [their services] very low and then (…) purchasing still comes to us and says, "Now we'll make another 5% cheaper, otherwise we won't do it” (START), which could result in projects not being financially viable. However, as 'START' came to realize that the purchasing department was inclined to push for discounts, they adjusted their pricing strategy to higher prices in future projects.

5. Results

The ‘AutoTECH’ and ‘START’ case serves as an illustration of how DT processes can unfold, here over the course of 100 days.

5.1. Practice changes and tensions

At ‘AutoTECH’, we observed changes in processes (e.g purchasing process, budgeting process, communication of DT initiatives), governance structures (formation of the DT department within R&D), strategy and vision (focus on digitalization and sustainability for building the car of the future), technology (implementation of new haptic software in the car seat) and culture (changed internal networking practices, less resistance towards startups

through targeted campaign and measures for fostering a startup-friendly culture). Given the project's constrained timeline of three months, the established purchasing practices no longer hold. Instead, the existing structures and processes underwent adaptations to accommodate shorter decision cycles. A specific DT department emerged, centered on the integration of digital haptic signals into 'AutoTECH's' car seats. This innovation aimed to connect the car's existing navigation system with the car seat, effectively transforming the vehicle's interior into a social medium capable of communicating with the driver. For 'START', we observed shifts in processes (e.g. purchasing process, development process, validation process), strategy and vision (focus on automotive industry, pricing strategy), technology (development of new haptic software) and culture (increased credibility on the automotive market, less concerns towards corporate takeover). These findings are in line with Vial (2019), who posits shifts in strategy, technology, processes, structures and culture during the DT process.

Furthermore, in our case, we can observe that DT fosters changes in strategic directions and value propositions as proposed by Matt et al., (2015), Wessel et al., (2021) and Vial (2019). Through the implementation of haptic technology to their car seats, 'AutoTECH' could provide new value offers to customers, including new propositions to safety and comfort (INNO). This is also likely to impact 'AutoTECH's' vision towards autonomous driving (START) and their market positioning strategy: "if you're looking for haptic or tactile seats, you'll actually only find us in partnership with [AutoTECH]" (START). On the other hand, 'START' adjusted their strategic direction as an aftermath to the joint project, as

Table 3: Overview of main quotes for practice changes across different phases of the DT project

Project Phase	**Key Quote**	**Implication/ Changes in Practices**
Preparation	"…at the strategic level, ['AutoTECH'] had expressed the [vision] of creating the car of the future, which actually means the device of the future."	Alignment of strategic areas and goals, focus on use cases, revised scouting and research practices
Preparation	"we no longer build things internally ourselves; we are opening up (…) and collaborate with startups that already have these solutions"	Establishment of new department, increased cooperation practices, changed budget allocation
Preparation	"to effectively provide the business unit with the right startup (…) and the first person's responsibility is to ensure this, while the second person has the operational task of accompanying the pilot project."	New practices: scouting, internal recruiting, direct communication with R&D
Preparation	"They (…) managed to condense the typical one year- long sales process with the supplier into just three weeks."	Shortened decision cycles, quicker adaptation
Preparation	"These are the issues we have to deal with, but we cannot deal with them ourselves, so structurally there was this new department in R&D."	Structural changes in governance, increased collaboration practices
Execution	"…'AutoTECH' and their startup partner conducted a problem-identification workshop to identify the core driving challenges and issues faced by drivers on the road."	Adoption of agile practices, transformation towards agility
Execution	"During the development phase, 'START' had the responsibility of ensuring that their solution complied with the regulatory requirements of the automotive industry."	Adaptation of research practices to automotive market, emphasis on compliance
Evaluation	"Finally, 'AutoTECH' launched their interior car solutions at the "EXPO Day" event."	Development of pitching practices, increased internal visibility
Evaluation	"Working with a large corporation allows us to validate whether what we are doing actually works in the market or within a product."	Validation through cooperation, professionalization of development practices
Execution	"As 'START' came to realize that the purchasing department was inclined to push for discounts, they adjusted their pricing strategy to higher prices in future projects."	Adjusted pricing strategy

they started offering their solutions with a focus on the automotive industry, thereby undergoing a substantial shift in their positioning as they originally operated within the health industry and provided user interfaces for prostheses (START).

Following the preparation and initiation of the DT project, we observed various practice shifts during the DT process (Soh et al., 2023; Pelletier & Raymond, 2020), such as changes in recruiting practices, scouting practices, testing practices, researching practices, developing practices, pricing practices, budgeting practices, project management practices, communication practices, or internal networking practices. Besides changes in already established practices, we could also observe the emergence of completely new practices such as collaborating practices or scouting practices. However, we observed more practice changes than complete practice births. Table 3 provides an overview of significant practice changes, as illustrated by selected quotes from the interviews.

Initiating the collaborative DT project also included tensions for both sides. Current literature shows that tensions arise, when existing ways of doing things no longer hold (Orlikowski & Scott, 2021), thus provoking a "contradictory demand" (Smith & Lewis, 2011, p. 381) between stability and change. In our DT case, we identified seven main tensions and resulting practice changes or practice emergences. The pre-defined project duration with a limitation to three months clashed with 'AutoTECH's' established processes, such as the purchasing process, which normally takes one year. Consequently, 'AutoTECH' had to adjust their purchasing process which involved skipping process steps such as providing supplier numbers and proceeding directly to drafting an offer. This tension provoked practice changes such as the direct integration of the legal department and the rapid provision of Non-Disclosure Agreements (NDAs) (practice variance). The same tension also fostered the formation of a new DT department, including new responsibilities and new operating practices (practice emergence). We find further tensions such as different levels of speed and resulting fears on both sides of the cooperation, cultural conflicts as well as regularities and standards within the automotive industry, which make it difficult -if not even sometimes impossible -for the startup to make their solution available at the automotive market. In line with current literature (Orlikowski & Scott, 2021; Gersch & Wessel, 2023), we find that tensions can act as the driving force for practice changes. Just as two different organizations with different constitutions start working together collaboratively during DT, tensions can emerge and the need to question existent practices becomes relevant (Orlikowski & Scott, 2021). As such, we find the DT project time limitation, different levels of speed, resulting fears on both sides of the cooperation, cultural conflicts as well as regularities and standards within the automotive industry as tensions within the DT process. As

Table 4: Main tensions and practice changes within the DT case

Project Phase	Tension observed in DT case	Classification of tension	Type of tension	Type of organization	Changes in Practices
Execution	Regularities and standards	Learning tension	Tactical	'START'	Collaboration practices
Preparation	Restructuration and formation of the new R&D department	Learning tension	Existential	'AutoTECH'	New operating practices, recruiting practices
Preparation	Conflicts within the purchasing process	Organizational tension	Existential	'START', 'AutoTECH'	Alternative practices, such as skipping the provision of supplier numbers
Preparation	Limited project duration	Organizational tension	Existential	'AutoTECH'	Alternative practices within the legal department
Preparation	Fear of insufficient resources	Performing tension	Pragmatic	'START'	Cooperation practices
Preparation	Fear of agile startups and resistance to cooperate	Performing tension	Pragmatic	'AutoTECH'	Communication practices
Evaluation	Underpaid project work	Performing tension	Pragmatic	'START'	Adjusted pricing practices

to dive deeper into the appearance of tensions as well as their driving force towards practices in the DT context, we will classify our observed main tensions and practice changes along the classifications and types as provided by Smith & Lewis (2011) and Orlikowski & Scott (2021) in table 4.

5.2. Imperfections

Besides tensions, we also observed another underlying driving force for practice changes within the DT process: imperfect conditions or imperfections. These conditions may include incomplete information, limited resources, or external factors that create challenges. Our case study shows, how changing imperfect conditions such as the need to showcase results at the “Expo Day” can provoke practice changes such as the cultivation of pitching practices. We find another example, where scouting practices arose due to imperfect conditions, the requirements of the open innovation platform. During the execution phase, ‘AutoTECH’ further experienced imperfect conditions as they were in need to align their software using practices to the new technology as provided by ‘START’.

Startups and established organizations have different approaches to projects, for example regarding their agility. The different approaches bring imperfect initial conditions to the workshops within their DT project; however, it does not provoke contradictory demands or conflicts as it would be the case for tensions. Nonetheless, we can also observe here that imperfect conditions can foster practice changes. In our case the imperfections provoke the implementation of project management software and thus, different project management practices. Another example tackles the development process. In the DT case, the startup developed the software, which eventually had to be tested to identify and rectify software bugs or glitches. The situation was new because the new technology as provided by the startup first met the in real-world scenarios and the car seat. It is also imperfect because the technology still had to be adapted until it finally fulfilled the expectations of both cooperation partners and the respective car drivers. As a result, extensive testing practices became essential. Also, we can classify the alignment of strategy as an imperfection, which stimulated subsequent changed budgeting practices.

6. Discussion and outlook

Current research suggests that tensions can function as driving forces and explanations for changes in practices (Orlikowski & Scott, 2021). An alternative viewpoint posits that organizational actors play a crucial role by introducing practice changes (Hernes, 2014). However, until now, we do not fully understand how tensions and other driving forces can foster new practices and practice changes in the context of DT.

6.1. Tensions and ImperfActions

To answer our research question and to better understand the underlying practice changes and their driving forces within the DT context, we conducted a pre-study and a subsequent in-depth case-study, which allowed us to illustrate the DT pathways. Our theoretical foundation drew upon practice theory and the notion of tensions within organizational change processes. During our study, we identified several practice changes and tensions (see table 3 and 4 for an overview). Interestingly, most tensions as observed in our case occurred during the preparation phase and prior to the actual beginning of the DT project. Also, we observed organizational, learning, and performing tensions but no belonging tensions in our case. We can further highlight the significant role of speed as a tension, which until now has been only a minor focus in the context of tension classification according to Smith/Lewis (2022). Through upcoming tensions, existing practices can get interrupted and called into question, which, in some cases, enables experimentation, innovation, and the emergence of new or edited practices (Orlikowski & Scott, 2021). Table 4 highlights that tensions, practice changes and practice emergences are inevitable components of the DT case and mutually intersect with each other. The tension influences the expression of the practice, whereas the practice also affects the emergence of tensions whenever existing practices get interrupted or no longer hold. Thus, in our case, we can confirm the role of tensions as a driving force for practice shifts amidst DT as outlined in current research (Orlikowski & Scott, 2021).

DT can be characterized as a process, where digital technologies play a central role in fostering organizational and societal changes, which then, trigger organizational responses which manifest themselves in changed practices, processes, and other facets (Vial, 2019). According to Soh et al. (2023), the DT process mostly starts with a strategic shift, giving rise to numerous different actions that may deviate from the traditional practices of the organization. These newly introduced actions subsequently trigger tensions, signifying a shift in the direction of organizational practices. This demonstration of events implies that practice variations and new

practices can begin to emerge even before tensions come into existence. This leads us to consider the existence of an additional, underlying, or early driving force for practice changes within the DT process, which can explain and foster practice changes and the birth of new practices.

During the case, we observed several imperfect conditions. Drawing on Soh et al., (2023), we posit that strategic shifts or the initiation of DT processes as responses to imperfect conditions can already stimulate practice changes. Thus, we underscore the potential for driving forces such as imperfections to result in the emergence of new or altered practices (Danner-Schröder & Geiger, 2016). DT processes can constitute imperfect conditions through several challenges such as change processes with (un)intended effects regarding technology and human tasks, the need to (re)define or adjust organizational and cognitive framings and/or new digital practices that need to be adapted within organizations (Gersch & Wessel, 2023). Through upcoming imperfections, established organizational practices get interrupted and called into question, which enables the emergence of new or edited practices (Orlikowski & Scott, 2021). Thus, imperfect conditions, include a performative character and can – besides tensions - serve as catalysts for practice changes. Within the DT context, imperfections can open up the space for renewal and modification (Orlikowski & Scott, 2021). This performative process stemming from imperfection aligns with the concept of 'action' as a performative component. We summarize these performative imperfect conditions as ‘imperfActions’, thus introducing a new term in line with our practice-based approach. ‘ImperfAction’ marks the space in which practice changes can occur due to imperfect conditions, without necessarily involving the emergence of tensions.

The concept of 'imperfAction' adds a new dimension to our theoretical framework, highlighting how imperfect conditions—often overlooked in practice theory discussions—play a crucial role in instigating practice changes. This extension of the theory not only acknowledges the existence of imperfections as catalysts for change but also emphasizes their performative aspect in the evolution of organizational practices. This also aligns with the S-as-P perspective. By applying the S-as-P framework, we can further elucidate how 'ImperfAction' contributes to the strategy making process in the context of DT. For instance, 'START's engagement with 'AutoTECH' through the open innovation platform represents a strategic practice that leverages external collaborations to drive its own DT and strategic renewal. Our findings, viewed through the lens of strategy-as-practice, highlight the significance of 'ImperfAction' as both a strategic response to and a driver of DT. Finally, we posit that - in addition to tensions - imperfect conditions can explain how new practices and practice changes come into existence. Consequently, both imperfections and tensions can both act as drivers for change (Schatzki et al., 2001) within the DT process.

6.2. Contributions

Our case study’s key contributions are threefold. First, our research contributes to a more nuanced understanding of practice changes during DT as we further detect the interplay between tensions and their implications towards practice changes or practice emergences. We contribute to a more nuanced comprehension of how practices evolve in the context of DT, thereby enriching the interpretation of practices as susceptible to change.

Thereby, we also contribute to the understanding of tensions by situating them within the context of the DT process and elucidating their interplay with other alterations during the DT journey. Through our analysis, we better understand which tensions can arise in the context of DT and how the different types of tensions manifest themselves in practice changes or even practice births over the course of DT. We identify and analyze tensions arising from discrepancies between established organizational processes and project constraints. These tensions serve as catalysts for practice changes, prompting adaptations in purchasing, communication, and governance structures. Our findings highlight the role of tensions in driving organizational practice change during DT initiatives.

Second, our study makes a significant contribution to understanding the driving forces for practice changes within DT as we identify imperfections as an underlying or early driving force within the DT process. We show that imperfections - besides tensions - can foster practice changes. Through their performative character, imperfections stimulate the creation of changed or even new organizational practices. Third, we introduce the novel term 'imperfAction' to the discourse on DT, thus acknowledging the performative power of imperfect conditions. Building on existing literature, we introduce the concept of ‘imperfActions’

to describe the role of imperfect conditions in facilitating practice changes within DT processes. Imperfect conditions such as time constraints and divergent organizational approaches trigger practice changes without necessarily provoking tensions. This conceptual framework expands our understanding of the drivers of organizational practice change in DT initiatives. By situating 'imperfAction' within the broader discourse on practice theory and tensions, we provide a nuanced perspective on the forces shaping organizational changes in the DT era. This insight challenges and extends the current understanding of practice theory, suggesting that imperfections—alongside tensions—serve as drivers for practice changes.

6.3. Managerial implications

Embarking on a DT journey often involves organizational challenges (Orlikowski & Scott, 2021; Wessel & Gersch, 2023). To better address these challenges, we hereby provide implications for managers to engage within the process of DT. These insights are intended to assist managers in the planning and effective management of the DT process.

A central aspect for management lies in coordinating tensions and imperfections and leveraging them as drivers for change (Haring et al., 2023). This entails anticipating tensions and imperfections from the beginning, actively reflecting on them, and thereby using their constructive power. This can facilitate the implementation of DT arrangements. Managers should increase their level of reflexivity and process sensitivity, by actively embracing and harnessing tensions for both intended and unintended changes, while acknowledging limited control over the dynamics along the DT journey. By recognizing and addressing tensions, organizations can navigate the complexities of DT projects more effectively, fostering smoother implementation and successful transformation outcomes. Additionally, our conceptualization of ‘imperfActions’ underscores the importance of embracing imperfections as opportunities for innovation and adaptation in DT processes. According to ‘INNO’, organization need to guide their DT projects along five change dimensions in order to make DT projects successful. These dimensions include a) strategy (formulation of a clear and coherent DT strategy), b) governance structure, c) processes, d) resources, e) Key Performance Indicators (KPIs) and f) culture. These six key dimensions need continuous examination and alignment to ensure the success of a DT project.

6.4. Limitations and outlook

The presented research findings must be contextualized in light of some limitations. Firstly, we conducted a single case study to illustrate the implications of DT for organizational practices. Here, we used interviews as well as secondary data as we could not participate in the project ourselves. In this context, it is important to acknowledge the potential for bias effects stemming from ex-post interviews and narrative intentions. However - like all single case studies - there is limited generalization power (Yin, 2018). To enhance the robustness of our data, we used multiple sources of secondary data to cross-verify information. Additionally, we selected interviewees based on their firsthand knowledge of the project. However, the case study only represents a partial glimpse into the DT project journey. To further strengthen data triangulation, we suggest that further research should offer a coordinated set or sequence of longitudinal process studies, where ‘imperfActions’, tensions, practices and DT journeys can be observed over an extended period. To strengthen generalizations and to further extend our understanding of the DT process, we recommend further extensive research regarding a broader spectrum of cases across different industries, types of organizations, and DT contexts.

Our case study provides initial insights into ‘ImperfAction’ and the types of tensions involved. However, further process-sensitive research would enhance our understanding towards practice changes within DT. We thus suggest extending research about practice changes by analyzing potential patterns for ‘imperfActions’ or tensions, further types of tensions and their appearance within the DT process. Our exploration into 'imperfAction' opens up new avenues for research, inviting scholars to further investigate the performative nature of imperfections in organizational change processes. Future studies could delve into the specific conditions under which imperfections lead to constructive practice changes and how organizations can harness these imperfections to facilitate their DT journeys. Additionally, examining the interplay between 'imperfAction' and tensions in varying organizational contexts and industries could enrich the discourse on DT and organizational change.

References

Bledow, R., Frese, M., Anderson, N., Erez, M., & Farr, J. (2009). A Dialectic Perspective on Innovation:Conflicting Demands, Multiple Pathways, and Ambidexterity. Industrial and Organizational Psychology, 2(3), 305–337.

Büchner, S., Hergesell, J., & Kallinikos, J. (2022). Digital Transformation(s): On the Entanglement of LongTerm Processes and Digital Social Change; An Introduction. Historical Social Research, 47(3), 7–39.

Chanias, S., Myers, M. D., & Hess, T. (2019). Digital transformation strategy making in pre-digital organizations: The case of a financial services provider. The Journal of Strategic Information Systems, 28(1), 17–33.

D'Adderio, L. (2014). The Replication Dilemma Unraveled: How Organizations Enact Multiple Goals in Routine Transfer. Organization Science, 25, 1325–1350.

Danner-Schröder, A., & Geiger, D. (2016). Unravelling the Motor of Patterning Work: Toward an Understanding of the Microlevel Dynamics of Standardization and Flexibility. Organization Science, 27, 633–658.

Deken, F., Carlile, P. R., Berends, H., & Lauche, K. (2016). Generating novelty through interdependent routines: A process model of routine work. Organization Science, 27(3), 659–677.

Eisenhardt, K. M. (1989). Building theories from case study research. Academy of Management Review, 14(4), 532–550.

Farjoun, M. (2010). Beyond dualism: Stability and Change as a Duality. Academy of Management Review, 35, 202–225.

Feldman, M. S., & Orlikowski, W. J. (2011). Theorizing practice and practicing theory. Organization Science, 22, 1240–1253.

Gersch, M., & Wessel, L. (2023). Digital Transformation in Health Care – The role of professional practices. In M. Kipping, T. Kurosawa, & E. Westney, (Eds.): Oxford Handbook of Industry Dynamics, 2023, Oxford University Press, https://academic.oup.com/edited-volume/38852.

Goh, K. T., & Pentland, B. T. (2019). From actions to paths to patterning: Toward a dynamic theory of patterning in routines. Academy of Management Journal, 62(6), 1901–1929.

Giddens, A. (1984). The constitution of society. Outline of the theory of structuration. Polity Press, Cambridge.

Haring, M., Freigang, F., Gersch, M., & Amelung, V. (2023): Tensions between the Professions: How Integrated Care Can Benefit from Better Understanding and Managing Conflicting Perspectives and Demands. International Journal of Integrated Care, 23(2), 1–6.

Helfat, C. E., & Martin, J. A. (2015). Dynamic Managerial Capabilities: Review and Assessment of Managerial Impact on Strategic Change. Journal of Management, 41(5), 1281–1312.

Hernes, T. (2014). A Process Theory of Organization. Oxford: Oxford University Press.

Jazabkowski, 2003: Strategic Practices: An Activity Theory Perspective on Continuity and Change

Jarzabkowski, P., & Spee, P. (2009). Strategy-as-practice: A review and future directions for the field. International Journal of Management Reviews, 11(1), 69–95.

Kane, G. C. (2017): „Digital maturity not digital transformation. Retrieved at 09/12/2023 from https://sloanreview.mit.edu/article/digital-maturity-not-digital-transformation/

Kohtamäki, M., Whittington, R., Vaara, E., & Rabetino, R. (2018). Making connections: Harnessing the diversity of strategy-as-practice research. International Journal of Management Reviews, 24(2), 210–232.

Schatzki, T. R., Knorr-Cetina, K., & von Savigny, E. (2001). The Practice Turn in Contemporary Theory. London: Routledge, 175–188.

Matt, C., Hess, T., & Benlian, A. (2015). Digital Transformation Strategies. Business & Information Systems Engineering, 57(5), 339–343.

Nicolini, D. (2012). Practice theory, Work, and Organization: An Introduction. Oxford: Oxford University Press.

Orlikowski, W. J., & Scott, S. V. (2021). Liminal innovation in practice: Understanding the reconfiguration of digital work in crisis. Information and Organization, 31(1), 1–6.

Pelletier, C., & Raymond, L. (2020). Orchestrating the digital transformation process through a 'strategy- as-practice' lens: A revelatory case study. Paper presented at the Proceedings of the 53rd Hawaii International Conference on System Sciences, 4316–4325.

Pentland, B. T., Yoo, Y., Recker, J., & Kim, I. (2022). From Lock-In to Transformation: A Path-Centric Theory of Emerging Technology and Organizing. Organization Science, 33(1), 194–211.

Putnam, L. L., Fairhurst, G. T., & Banghart, S. (2016). Contradictions, dialectics, and

paradoxes in organizations: A constitutive approach. Academy of Management Annals, 10(1), 65–171.
Reckwitz, A. (2002). Toward a theory of social practices: A development in culturalist theorizing. European Journal of Social Theory, 5, 243–263.
Riasanow, T., Setzke, D. S., Böhm, M., & Krcmar, H. (2019). Clarifying the notion of digital transformation: A transdisciplinary review of literature. Journal of competences, strategy & management, 10(1), 5–31.
Schatzki, T. R. (1996). Social Practices. A Wittgensteinian Approach to Human Activity and the Social. Cambridge: Cambridge University Press.
Schatzki, T. R. (2002). The Site of the Social: A Philosophical Exploration of the Constitution of Social Life and Change. University Park: Pennsylvania State University Press.
Schatzki, T. R. (2019). Social Change in a Material World: How Activity and Material Processes Dynamize Practices. London: Routledge.
Seidl, D., & Whittington, R. (2021). How Crisis Reveals the Structures of Practices. Journal of Management Studies, 58(1), 240–244.
Sele, K., & Grand, S. (2016). Unpacking the dynamics of ecologies of routines: Mediators and their generative effects in routine interactions. Organization Science, 27(3), 722–738.
Smith, W. K., & Lewis, M. (2011). Toward a theory of paradox: A dynamic equilibrium model of organizing. The Academy of Management Review, 36(2), 381–403.
Smith, W. K., & Lewis, M. (2022). Both/And Thinking: Embracing Creative Tensions to Solve Your Toughest Problems. Boston: Harvard Business Review Press.
Soh, C.; Yeow, A.; & Goh, Q. W. (2023). Shaping Digital Transformation Pathways: Dynamics of Paradoxical Tensions and Responses. Journal of the Association for Information Systems, 24(6), 1594–1617.
Weber, J., & Elz, A. (2022). Corporate-Startup-Partnerschaften. Heidelberg: Springer Verlag.
Wessel, L., Baiyere, A., Ologeanu-Taddei, R., Cha, J., & Jensen, T. B. (2021). Unpacking the difference between digital transformation and IT-enabled organizational transformation. Journal of the Association for Information Systems, 22(1), 102–129.
Yin, R. K. (2018). Case Study Research: Design and Methods, Vol. 6, New York: SAGE Publications.

Author biographies

Natalie Mahlert is a research associate at the Department of Information Systems at the Free University of Berlin. Her research focuses on digital transformation, organizational change, and business processes. She investigates these topics through a practice-based approach, which involves examining real-world practices and their implications for theory and application. Her work has been published in the European Management Journal and presented at the EURAM conference.

Martin Gersch is a Full Professor at the School of Business & Economics at the Free University of Berlin, and a founding member of the Information Systems Department. Since 2017 he is Principal Investigator for „Digital Transformation“ at the Einstein Center Digital Future. His research focuses on technology-driven change and transformation processes, digital innovations, and new business models for digital health innovations. His work has been published on international conferences and in academic journals, including Organization Studies, European Journal of Information Systems, and the Journal of Management Studies.

Acknowledgements

We would like to express our sincere gratitude to the editorial team of the Journal of Competences, Strategy, and Management, with special appreciation to the editor Ann-Christine Schulz and the two reviewers for their valuable feedback and guidance throughout the revision process.

License