

Not So Different After All

The Role of Dynamic Capabilities and Heuristics in Navigating the
Uncertainty of Digital Transformation

May 2023

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Abstract

Artificial Intelligence has caused excitement and concern in general society and knowledge-generating businesses in particular. Especially the value-offering of management consultancies, which is creating and providing the latest expertise, is disrupted by the democratization of knowledge. Hence, the importance of Artificial Intelligence and Data Analytics in this industry is undisputed. We consequently set out to understand how management consultancies deal with the increasing uncertainty brought by Digital Transformation. Through the Dynamic Capabilities framework lens, we investigate the topic from two contradicting perspectives: Digital Dynamic Capabilities and Heuristics. Based on a multiple case study, including five management consultancies from four European countries, we conduct qualitative interviews and collect archival data. The results highlight that digitally transforming companies need Digital Dynamic Capabilities and Digital Heuristics to capture opportunities from Digital Transformation and manage related uncertainties. Our central contribution emphasizes that both concepts are interconnected, bridging their contradicting perspectives in the literature. We suggest an empirically grounded framework based on three levels of Dynamic Capabilities, offering required, theoretical structure, and unity. In addition, our results show that Digital Dynamic Capabilities should increasingly be regarded as a key component that allows for the Digital Transformation of businesses. Secondly, when communicating with internal and external stakeholders, expertise in the form of Digital Heuristics can serve as a source of value creation.

Key Words: dynamic capabilities, heuristics, digital transformation, management consultancies, theory building

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Acknowledgements

As we reach the end of our academic journey, we would like to express our gratitude to the supportive individuals who have been with us throughout our studies and the writing of this thesis. Our families have been our pillars of strength; we could not have accomplished this without them. Our fellow students have become cherished friends, and we are thankful for the six years of memories we have shared. We extend our appreciation to Åke Freij, our supervisor, who has been unwavering in his support and has played a significant role in enhancing the quality of our work. Åke's dedication to continuous learning has been a source of inspiration for us. We would also like to thank the 18 anonymous participants who voluntarily shared their valuable thoughts and enthusiasm. Lastly, we acknowledge the contributions of Leonhard, Mathias, and Matteo, who provided us with insightful feedback.

As we conclude this chapter of our lives, we hope that the friendships we have formed will endure.

Glossary

Artificial Intelligence (AI)	A system's ability to interpret external data correctly, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation.
Digital Dynamic Capabilities (DDC)	Asserts that Dynamic Capabilities and Digital Transformation are interdependent and introduces the development of unique Dynamic Capabilities to gain the benefits of Digital Transformation.
Digital Heuristics (DH)	The articulated rules-of-thumb, shared by multiple organizational members, that are learned from the process experience of Digital Dynamic Capabilities' microfoundations and facilitate decision-making and organizational action.
Digital Transformation (DT)	Refers to the use of new technologies to transform organizations, often resulting in significant changes to a company's strategy, operations, and culture, driven by competition.
Dynamic Capabilities (DC)	Mechanisms to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments.
Dynamic Capability conceptualization based on Eisenhardt and Martin (EM)	The firm's processes that use resources – specifically the processes to integrate, reconfigure, gain, and release resources – to match and even create market change. Dynamic Capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die.
Dynamic Capability conceptualization based on Teece, Pisano and Shuen (TPS)	The firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments and sustain a competitive advantage.
Heuristics	The articulated and often informal rules-of-thumb shared by multiple participants within a firm that direct attention and facilitate decision-making and organizational action. These shortcuts emerge when information, time, and processing capacity are limited.
Resource Based View (RBV)	Theory that aims at explaining how valuable, rare, inimitable, and non-substitutable resources enable a firm to develop competitive strategies.
Risky Environment	Environment in which risks can be calculated as probabilities.
Uncertain Environment	Environment in which companies encounter unknown unknowns.
VRIN	Resources must have the following four characteristics to be the source of a sustainable competitive advantage: valuable, rare, inimitable, and non-substitutable.

1. Introduction

“I think that OpenAI is the biggest thing that has happened for years. This will change everything. I'm so sure about that. However, I'm just not too sure whether we are in the state right now where we know how to use it, why use it? Are the clients ready to use it?” *Manager S1*

This statement from an experienced Strategy Consultant, echoing both optimism and perplexity, reflects the current situation in society and especially in the consulting industry, including the major players in the field such as Bain & Company, Boston Consulting Group, and PricewaterhouseCoopers (Bain, 2023; BCG, 2023; Murgia et al., 2023). The Digital Transformation of industries evoked by Artificial Intelligence and Data Analytics is overwhelming both the consultancies themselves and their clients through the increasing number of more sophisticated technologies entering the market in shorter time intervals. This represents both uncertainty and an abundance of opportunities in the consulting industry (Matt et al., 2015). Investing in the right technology innovations will allow companies to stay competitive, while investing in the wrong ones could even harm future success (Adner, 2019). Such dilemma that consultancies face (Nissen, 2018) hinders them from making the most out of their environmental conditions, which is an unforgivable aspect in such a competitive market as the consulting industry (Matt et al., 2015; Warner & Wäger, 2019). This motivated us to tackle this circumstance originating from Digital Transformation from an academic standpoint.

1.1 Purpose of Study

One possible way to exploit opportunities while managing uncertainty for firms is to view events through the widely used lens of the Dynamic Capabilities framework (Eisenhardt & Martin, 2000; Teece et al., 1997). However, the field of Dynamic Capabilities is divided into two groups of authors with nearly opposing core statements, namely Dynamic Capabilities by Teece, Pisano, and Shuen, and Heuristics by Eisenhardt and Martin, challenging the theoretical and practical applicability of the framework (Peteraf et al., 2013). Nonetheless, the consulting industry is an optimal study setting to investigate whether both theoretical camps can be found there despite their discrepancies and, if so, in what ways. Because this industry sector, even compared to other typically uncertain industries, displays extraordinary amount of factors that create unknown-unknowns (Nissen, 2018). Accordingly, to improve both the current comprehension and the explanatory power of the Dynamic Capabilities framework, we study the Digital Transformation of management consultancies to understand:

How do Management Consultancies utilize Heuristics and Dynamic Capabilities in their approach to cope with the uncertainty and opportunities marked by Digital Transformation?

In doing so, we take up the call to further unify the framework (Teece, 2023) using theory-building and elaboration methods (Eisenhardt, 1989). For this, we conduct a multiple case study including five management consultancies from four European countries as case companies, based on qualitative interview and archival data.

By exploring the different manifestations of Dynamic Capabilities in consultancies, the study aims, on the one hand, to provide an overview of the current capabilities of different firms that can be used to deal with Digital Transformation. On the other hand, this theory building should shed light on achieving the following: Perceiving and capturing new opportunities created by Digital Transformation better in the future. Likewise, uncertainty based on external factors is to be mitigated with the knowledge gained. For this purpose, this paper intends to precisely describe the role of Digital Dynamic Capabilities and what other possibilities exist within the theoretical framework of Dynamic Capabilities. Specifically, the study investigates whether companies have built up capabilities not yet anchored in theory, in addition to the known capabilities, which may explain current resilience to uncertainty.

1.2 Study Scope

To provide a clear scope for this study, it is essential to establish the boundaries within which our research operates. We focus the research project in three ways: Thematic, methodological, and temporal. The thematic scope of this study lies within the Dynamic Capabilities framework. It doesn't intend to understand the structures and mechanisms of Digital Transformation. Neither does it intend to investigate specific digital technologies. Instead, this paper aims to comprehend how firms cope with the market dynamics evoked by Digital Transformation. The methodological scope lies within an explorative, qualitative research design. Therefore, this study doesn't aim at quantifying effect sizes. A discussion of performance indicators and, consequently, competitive advantages is thus omitted. Finally, the temporal scope is limited to a time frame of four months. Thus, this paper doesn't represent a longitudinal study. Rather, we take a cross-sectional snapshot of how management consultancies cope with the Digital Transformation environment.

1.3 Study Structure

The paper is structured as follows: First, we establish the Theoretical Background (Chapter 2.): Defining Digital Transformation and the abilities of related digital technologies. Next, we determine the explanatory power of the Resource Based View and Dynamic Capabilities in the context of Digital Transformation. Based on the Theoretical Background, the research question of this paper is derived through a Problematization (Chapter 3.). The Methodology section (Chapter 4.) describes methodological considerations and displays the data collection and analysis process. The outcomes of the analysis are presented in the Results (Chapter 5.) section. Finally, in Discussion (Chapter 6.), we answer the research question and place our results in the context of research on Dynamic Capabilities.

2. Theoretical Background

This section establishes the theoretical basis of our study. First, we explain Digital Transformation (Chapter 2.1) and then discuss the topic from the perspective of the Resource Based View (Chapter 2.2). We subsequently link it to the concepts of Dynamic Capabilities and Heuristics (Chapter 2.3). Doing so, we compare two conceptualizations of Dynamic Capabilities and uncover a gap in the literature.

2.1 Digital Transformation

The way companies interact with their clients has significantly evolved over the last decade, and consulting firms are no exception (Christensen et al., 2013; Nissen, 2018; Warner & Wäger, 2019). Recent developments in the industry have shown that Digital Transformation (DT) has played a significant role in this change. DT refers to the use of new technologies to transform organizations (Westerman et al., 2014). This often results in significant changes to a company's strategy, operations, and culture, also referred as organizational transformation (Child & Smith, 1987).

Technologies can initiate such transformation and provide new opportunities to a more efficient and success-promising future (Westerman et al., 2014). Hence, organizations are increasingly expected to incorporate digital technologies to improve competitiveness (Schallmo et al., 2017). From this perspective, DT can also be seen as a way to impact a company's efficiency and effectiveness by improving its repertoire of resources and capabilities (Reddy & Reinartz, 2017). Two technological developments that can trigger these kinds of disruptive organizational changes are Artificial Intelligence (AI) (Shrestha et al., 2019) and Data Analytics (Russom, 2011). We focus explicitly on these two in the study, as the effects of DT on an organization introduced by those technologies are particularly striking and imminent (Kolbjørnsrud et al., 2016). AI is “a system's ability to interpret external data correctly, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation” (Haenlein & Kaplan, 2019, p. 5). The term AI is a moving target as the technology constantly expands in performance and scope (Berente et al., 2021; Haenlein & Kaplan, 2019; Kaplan & Haenlein, 2020). Specific AI technologies are, therefore, not defined in this paper. Data Analytics, on the other hand, “is concerned with [the] extraction of actionable knowledge and insights from [...] data” (Rajaraman, 2016, p. 701). Thus, Data Analytics addresses a much broader spectrum of digital tool due to the absence of flexibility and the capability to learn.

However, DT goes beyond just redesigning value creation. It involves restructuring business processes to fully utilize a company's core competencies through digital technology, resulting in a competitive advantage (Schwertner, 2017). This transformation allows for the continuous development of new strategic capabilities to improve organizational performance and adaptability in the rapidly changing digital landscape (Sousa-Zomer et al., 2020). But, the availability and affordability of digital technologies require firms to constantly transform in order to avoid falling behind competitors and losing relevance in the unpredictably expanding digital market (Berman, 2012). This creates uncertainty and to better understand how firms can incorporate the benefits of DT to mitigate it, one can analyze the explanatory power of

existing theories. We will be using specifically two theoretical concepts considered to be most prominent and essential ones. However, they have both similarities and fundamental differences, an essential aspect of our scientific work.

2.2 Resource Based View

The Resource Based View (RBV), the first theoretical framework we use to link DT to existing theories, was introduced by Barney in 1991 (Lavie, 2006), explaining how resources enable a firm to develop competitive strategies:

“All assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness” (Barney, 1991, p. 101).

Barney and his colleagues use the terms resources and capabilities interchangeably in the RBV framework, referring to the tangible and intangible assets used by companies to develop and implement their strategies (Ray et al., 2004). Furthermore, one of the most fundamental propositions of the RBV is that competitive advantage is achievable (Barney, 1991) if a firm can develop strategies that exploit the opportunities of its resources to differentiate itself from its competitors (Porter, 2008). According to Barney, for these opportunities to be present in assets, they must have the following four characteristics: Valuable, rare, inimitable, and non-substitutable (VRIN) (Barney, 1991; Eisenhardt & Martin, 2000; Peteraf, 1993). In the RBV there are different interpretations and accordingly different abbreviations for the necessary properties of resources (Furr & Eisenhardt, 2021) but for the purpose of this paper, the VRIN categorization is chosen as it is being used by representatives of the Digital Capabilities concept (Eisenhardt & Martin, 2000).

Another fundamental proposition of the RBV is the assumption that assets with VRIN characteristics can deal with uncertainty in the business environment (Mascarenhas, 1982). Economic analysis has long dealt with uncertainty, with many theories addressing the subject matter (Bylund & McCaffrey, 2017; McMullen & Shepherd, 2006). The Schumpeterian perspective has been particularly influential (Block et al., 2017), emphasizing the importance of identifying and deploying the right resources and capabilities in uncertain environments (Black & Boal, 1994; Mahoney & Pandian, 1992; Mathews, 2002). By proactively building a portfolio of VRIN resources and capabilities, companies can position themselves to cope with Schumpeterian uncertainty and benefit from it (Alvarez & Barney, 2017). Applying the RBV enables companies to hedge against uncertainty in the marketplace (Rogers, (2016).

Therefore, the RBV can help better to understand business implications in the face of DT. Suitable assets to build resilience against uncertainty are digital technologies (McAfee & Brynjolfsson, 2012). By utilizing such valuable assets, businesses can make more informed decisions and increase efficiency. These digital resources can be rare and difficult to imitate, often requiring significant investments in technology, talent, and organizational change (Liu et al., 2011). In addition, the benefits of DT can be challenging to

substitute because they are often unique to the organization and its specific activities. Consequently, in line with the RBV, the digital assets introduced by DT can provide companies with a competitive advantage in the modern business landscape (Adner et al., 2019; Brynjolfsson & Hitt, 2000; Verhoef et al., 2021). Accordingly, companies must focus on building and leveraging digital assets and capabilities, but by developing a coherent digital strategy rather than simply adopting the latest technologies to maximize their value (Adner et al., 2019; McAfee & Brynjolfsson, 2012; A. Singh & Hess, 2017).

2.3 Dynamic Capabilities

However, the explanatory power of the RBV does not cover “how firms develop or acquire new resources and manage them over time” (Teece, 2023, p. 115). Hence, the Dynamic Capabilities (DC) framework emerged (Teece, 2023). In particular to explore how unpredictable markets affect a company's advantages (Helfat & Peteraf, 2003) as the RBV alone cannot explain a company's competitiveness in rapidly-changing environments. Justified is this argument by the claim that it does not account for the importance of capabilities in building resources that can handle uncertain situations. While the RBV focuses on what firm-specific resources and capabilities must be in place to gain a long-term competitive advantage (Barney, 1991; Peteraf, 1993), the DC framework focuses consequently on how combinations of such resources can be developed, leveraged, and secured over time to respond to a changing industry.

The field of DC is divided in two clusters of authorship, complicating the theoretical and practical applicability of the framework (Peteraf et al., 2013). The first one corresponds to Teece, Pisano, and Shuen's (1997) understanding of DC, now referred to as TPS. The other one addresses the conceptualization by Eisenhardt and Martin (2000), which we will refer to as EM. In the following, we will provide clarity on the commonalities and differences between both perspectives, outlining their primary assumptions. First, we delve into TPS and subsequently focus on EM.

Dynamic Capabilities (TPS)

First, TPS define DC as:

“[...] [T]he firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments” (Teece et al., 1997, p. 516).

A company's success in a dynamic market relies, therefore, on its ability to adapt to changing conditions, according to TPS. To answer how organizations can maintain a competitive advantage despite fast-changing technological, economic, and social conditions (Teece, 2007, 2014a, 2017, 2018; Teece et al., 1997), TPS state three key capabilities: The first is Sensing, which refers to identifying and responding to opportunities and threats (Teece, 2007). The second is Seizing or taking advantage of those opportunities. Finally, there is Transforming, which involves keeping the organization competitive by transforming its assets. Organizations can adapt to environmental changes by mastering these abilities and even shaping them to their advantage (Teece et al., 1997). This approach is widely accepted in the scientific community (Warner & Wäger, 2019) and will be used throughout the following chapters.

Fundamentals of Dynamic Capabilities

Central to TPS's DC concept is the importance of microfoundations regarding the following factors: Achieving decentralization and near decomposability (Teece, 2007), managing co-specialization (Katkalov et al., 2010), learning (Easterby-Smith & Prieto, 2008), knowledge management, and governance (Nooteboom, 2009). Microfoundations serve here as the foundation for the DC: Sensing is done by analytical systems, seizing achieved by supporting enterprise structures and transforming by re-alignment procedures (Teece, 2007). Furthermore, microfoundations allow the integration, the building, and, above all, the reconfiguration of internal and external competencies in response to changes in the markets (Helfat & Peteraf, 2015; Teece, 2007, 2016). Here, organizational learning in the form of continuously updating knowledge bases, expanding capabilities, and incorporating new technologies is a critical dimension (Helfat & Peteraf, 2015). According to TPS, this learning corresponds to management and organizational processes, which are equally crucial as assets (Zahra et al., 2006). In this way, learning becomes a critical aspect of DC, enabling organizations to be proactive and positioning themselves for long-term success (Aragón-Correa & Sharma, 2003).

Dynamic Capability and uncertainty

TPS also justify the importance of organizational learning, claiming that organizations with DC are better equipped to navigate through uncertainty because they can quickly adapt to disruptions and identify new growth opportunities, creating long-term value for their stakeholders (Teece, 2016). Teece and colleagues (2016) refer to Knightian Uncertainty, a concept developed in 1921 (Epstein & Wang, 1994) to describe situations in which the probability of outcomes cannot be determined. The prevalence of Knightian uncertainty in complex and dynamic environments presents significant challenges to organizations. It requires adaptive and flexible responses that can accommodate a range of possible futures (Augier & Teece, 2008). This requirement ought to be addressed by the concept of DC, which can deal with uncertainty and build resilience in the face of unpredictability by sustaining and renewing capabilities (Schoemaker et al., 2018; Teece, 2014b, 2016; Teece et al., 2016).

Digital Dynamic Capabilities

The disruptions in the market, as discussed by TPS, and the uncertainty that companies face today align with the concept of DT, according to Andal-Ancion et al. (2003). DT is continuously changing the business landscape and increasing the importance of DC in achieving a sustainable competitive advantage, as indicated by Warner and Wäger (2019). This connection has resulted in the emergence of Digital Dynamic Capabilities (DDC) (Cannas, 2021; Chirumalla, 2021; Ellström et al., 2022; Soluk et al., 2021; Warner & Wäger, 2019; Witschel et al., 2019; Wohlleber et al., 2022), which asserts that DC and DT are interdependent. Digital technologies introduced by DT require the development of unique DC to gain their benefits. This transformation is occurring across entire industries, including consulting services, from both societal and business perspectives (Nissen, 2018), posing in consequence entirely new challenges to companies regarding their business strategy (Berman, 2012).

Especially, such development of DC allows for exploring and exploiting arising opportunities in form of new digital technologies (Matt et al., 2015). However, market environments evolve faster due to digital disruptions, necessitating a new level of flexibility and adaptability (Warner & Wäger, 2019). Therefore, companies must develop Digital Capabilities that go beyond traditional DC to succeed in the digital marketplace. This new DC version focuses on using digital technologies to drive change in current business models, products, and services (Ellström et al., 2022). Furthermore, to enhance these capabilities, it is essential to focus on developing the necessary microfoundations (Warner & Wäger, 2019). This includes emphasizing digital leadership, fostering a culture of innovation and experimentation, and implementing an agile organizational structure.

Digital Sensing

Beyond the ability to recognize and anticipate market changes, as Sensing is originally understood DC (Dosi & Teece, 1998), this version refers to a company's ability to continuously monitor its internal and external environment and collect data to identify changes and new business opportunities (Ellström et al., 2022; Warner & Wäger, 2019). For this, companies must additionally have the appropriate digital tools and processes to collect, analyze, and react quickly to changes in the market (Chirumalla, 2021).

Digital Seizing

In addition to responding quickly and effectively to new opportunities, Digital Seizing refers to modifying one's resources and processes and creating new customer value by taking advantage of digital technology (Warner & Wäger, 2019). Companies must already have a clear digital strategy and an agile organizational structure to exploit such emerging opportunities (Chirumalla, 2021).

Digital Transforming

Alongside a firm's ability to continuously evolve and innovate to meet the changing needs of its customers and the market, Digital Transforming is mainly about the skill of changing business models in innovative ways by integrating digital technologies (Warner & Wäger, 2019). This kind of DC is characterized by the fact that those strategic advancements must also take place continuously due to firms' permanently changing market environments through DT (Chirumalla, 2021). Sustainable competitive advantage is only possible with DDC if organizations transform themselves anew with any digital disruptions (Koch & Windsperger, 2017) to cope with the incoming industry uncertainty and to profit from it (Warner & Wäger, 2019).

Dynamic Capabilities (EM)

After outlining TPS's, we now turn to EM's conceptualization of Dynamic Capabilities. Similar to TPS, EM define DC in the following way:

“The firm's processes that use resources – specifically the processes to integrate, reconfigure, gain, and release resources – to match and even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die”
(Eisenhardt & Martin, 2000, p. 1107).

This definition highlights commonalities: Both views focus on organizational routines based on strategic and organizational processes. Additionally, both see DC as a continuation of the RBV (Peteraf et al., 2013). While common in those aspects, the two views are divided into three main differences over (1) boundary conditions, (2) sustainable advantages, and (3) competitive advantages (Peteraf et al., 2013).

In TPS's view, rapidly evolving and unpredictable environments are vital for DC (Peteraf et al., 2013; Teece et al., 1997). However, EM argue that such environments are merely boundary conditions (1) for the TPS framework (Eisenhardt & Martin, 2000; Peteraf et al., 2013). Instead, they require simple and unstable processes that align with the environmental conditions (Eisenhardt & Martin, 2000; Peteraf et al., 2013). Since DC are inherently unstable, they cannot provide sustainable advantages as markets change and evolve (Eisenhardt & Martin, 2000; Peteraf et al., 2013). Even in more predictable environments where DC represent best practices, the advantage cannot be sustained (2) as these practices can be substituted (Eisenhardt & Martin, 2000; Peteraf et al., 2013). Despite their unique content, DC have many similarities across different firms (Bingham & Eisenhardt, 2011; Bingham, Eisenhardt, & Davis, 2007; Bingham, Eisenhardt, & Furr, 2007; Eisenhardt & Martin, 2000). This understanding violates the VRIN characteristics of the RBV adopted by TPS and explains why EM argue that (3) DC only lead to a limited competitive advantage (Eisenhardt & Martin, 2000; Peteraf et al., 2013). In uncertain environments, the RBV logic breaks down as the continuance of competitive advantage is as unpredictable as the DC itself, which is the very basis of this advantage (Eisenhardt & Martin, 2000; Furr & Eisenhardt, 2021). Therefore, DC can be seen more as qualifiers than distinguishers when competing in uncertain market environments.

In EM's view, DC vary depending on market dynamics (Eisenhardt & Martin, 2000; Eisenhardt & Sull, 2001). In risky environments, DC take the form of detailed and analytical routines relying on existing knowledge. Conversely, they take the form of simple, experience-driven processes that create new knowledge in uncertain environments (Davis et al., 2009; Eisenhardt et al., 2010; Eisenhardt & Martin, 2000; Eisenhardt & Sull, 2001). These Simple Rules help companies capture the most promising opportunities in uncertain environments, while their ambidextrous nature addresses the balance between efficiency and flexibility (Davis et al., 2009; Eisenhardt & Martin, 2000; Raisch et al., 2009). By allowing for less structure, organizations can open up to new opportunities, while more structure allows the

organization to effectively execute those opportunities (Davis et al., 2009). As semi-structures, Simple Rules allow for both simultaneously (Davis et al., 2009; Eisenhardt et al., 2010). Heuristics are an empirically grounded form of those Simple Rules (Bingham & Eisenhardt, 2011; Loock & Hinnen, 2015).

Fundamentals of Heuristics

Bingham, Eisenhardt, and Furr define Heuristics as the “articulated and often informal rules-of-thumb shared by multiple participants within [a] firm” (Bingham, Eisenhardt, & Furr, 2007, p. 31). Analogous to findings of cognitive research in psychology, those Heuristics “direct attention and facilitate decision-making and organizational action” (Bingham, Eisenhardt, & Davis, 2007, p. 14). Therefore, Heuristics can be seen as “shortcuts that emerge when information, time, and processing capacity are limited” (Bingham & Eisenhardt, 2011, p. 1439). The sum of all Heuristics a firm has accumulated is called a portfolio of Heuristics.

There are four types of Heuristics: Selection, procedural, priority, and temporal (Bingham & Eisenhardt, 2011; Bingham, Eisenhardt, & Davis, 2007; Bingham, Eisenhardt, & Furr, 2007). Selection Heuristics assist in selecting opportunities, (Bingham, Eisenhardt, & Furr, 2007) while procedural Heuristics outline the necessary actions for executing a chosen opportunity (Bingham, Eisenhardt, & Furr, 2007). Temporal Heuristics pertain to timing, sequence, or synchronization when capturing opportunities, and priority Heuristics determine the ranking of opportunities (Bingham, Eisenhardt, & Furr, 2007). Hence, Heuristics within firms may differ in their specific content, but share a common structure across firms (Bingham & Eisenhardt, 2011). Heuristics can guide companies in selecting and executing opportunities and managing time and priority concerns in the process of opportunity capture (Bingham & Eisenhardt, 2011). In addition, these processes occur repeatedly over time, allowing for organizational learning, thereby developing Heuristics (Bingham, Eisenhardt, & Davis, 2007). This process requires cognitive engagement, where organizations develop expertise, and more than the simple accumulation of experience (Bingham, Eisenhardt, & Davis, 2007; Bingham, Eisenhardt, & Furr, 2007).

Consequently, like DC, Heuristics are not rigid but evolve. Organizations’ development of Heuristic portfolios can take two forms: First, they learn selection and procedural Heuristics before temporal and priority ones since the latter two require more experience and cognitive sophistication (Bingham & Eisenhardt, 2011). Second, they continuously refine and simplify their portfolio by adding, replacing, and subtracting Heuristics over time, in a process called simplification cycling (Bingham & Eisenhardt, 2011; Bingham, Eisenhardt, & Davis, 2007; Eisenhardt et al., 2010). This approach allows companies to become experts in effectively deploying their processes and adding new knowledge without adding structure (Bingham & Eisenhardt, 2011; Eisenhardt et al., 2010).

Heuristics and uncertainty

Heuristics are linked to the environment in two ways. First, they emerge especially in uncertain market environments. Second, they are particularly effective in such situations (Bingham & Eisenhardt, 2011; Bingham, Eisenhardt, & Davis, 2007; Davis et al., 2009; Guercini & Milanesi, 2020). Although different

terminologies in the literature on Heuristics describe the environment, such as stable vs. uncertain (Bingham, Eisenhardt, & Davis, 2007), stable vs. high-velocity (Eisenhardt & Martin, 2000), predictable vs. unpredictable (Davis et al., 2009), and ambiguous vs. unpredictable (Eisenhardt et al., 2010), they all relate to the predictability of events. For each comparison, the first counterpart refers to an environment in which risks can be calculated as probabilities, while in the second, a company encounters unknown unknowns. This differentiation is consistent with Knight's concept of risky vs. uncertain environments (Watkins & Knight, 1922), which is also relevant to the TPS conceptualization. In the following, we, therefore, refer to risky and uncertain when describing environments, as this shared differentiation allows for a consistent comparison between TPS and EM. In uncertain environments, Heuristics limit errors, allow for improvisation, and focus attention, making them an optimal structure in such environments (Davis et al., 2009).

Heuristics in Digital Transformation

While the specifics of DC in the DT context have already been covered for TPS's conceptualization of DC (Cannas, 2021; Chirumalla, 2021; Ellström et al., 2022; Soluk et al., 2021; Warner & Wäger, 2019; Witschel et al., 2019; Wohleber et al., 2022), this is not the case for Heuristics. Thereby, the circumstances caused by DT, especially the abundance of opportunities and the prevalence of uncertainty, correspond to situations in which Heuristics are considered effective. The question arises about the possible specificities of the Heuristics concept in DT, especially since most of the findings on Heuristics are based on data from other contexts, such as the internationalization processes of entrepreneurial firms (Bingham & Eisenhardt, 2011). We identify the need to expand the understanding of Heuristics in organizations to assess their explanatory power of how companies deal with DT.

3. Problematization

Following the presentation of the theoretical foundations of our work, we will proceed to a detailed elaboration of a problematization grounded in this knowledge. Thereby, we address how the two opposing camps in Dynamic Capabilities jointly suggest a research gap, despite their supposedly fundamental differences regarding key aspects. For this purpose, we examine how representatives of both research strands argue that theory development is needed, particularly regarding applicability in specific conditions and contexts such as Digital Transformation (Chapter 3.1). Then, after discussing why the consulting industry appears to be an optimal setting for this (Chapter 3.2), we establish the aim of this study by presenting our research question (Chapter 3.3).

3.1 Areas for Theoretical Exploration

Within the Dynamic Capability Framework

Although the DC perspective has established itself as one of the most influential theoretical concepts in organizational theory (Di Stefano et al., 2014), the research community believes that there is still a need for further development (Karimi & Walter, 2015; McGrath, 2013; Schilke et al., 2018; Teece, 2023; Warner & Wäger, 2019). By further enriching the DC perspective with other relevant theories (Arend & Bromiley, 2009; Helfat & Peteraf, 2009), an expansion of the current understanding of the theoretical assumptions underlying DC may be possible (Schilke et al., 2018). In particular, there are growing demands to unite the TPS conceptualization with the concept of Heuristics based on EM (Barreto, 2010; Peteraf et al., 2013; Wang & Ahmed, 2007), as they are supposed to be complementary and build on each other (Schilke et al., 2018). Further comparing both concepts and looking at their parallels and possible interplay may provide a greater understanding of how DC work (Schilke et al., 2018). Gray and Cooper (2010) exemplarily suggest identifying the conditions under which either theoretical approach fails, while Peteraf et al. (2013) additionally propose exploring the existence of constructs or concepts that could bridge the two perspectives. This is underpinned by the fact that both concepts of DC are important to firms.

Within Heuristics in Organizations

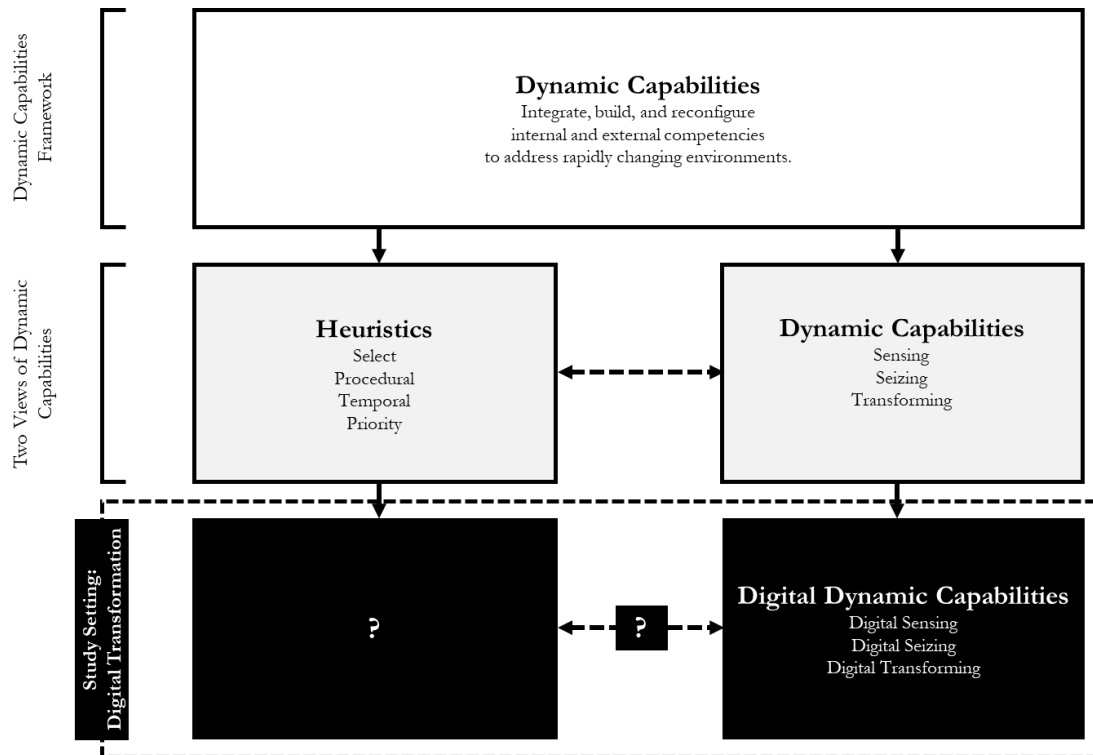
Besides the DC framework at large, the concept of Heuristics in organizations needs further development as well. In their literature review on Heuristics, Looock and Hinnen note that “we lack a systematic understanding of the distinct contingent issues that facilitate or hinder heuristic processing” (2015, p. 2033). The specific conditions, and contexts of using Heuristics are marked as points of interest when investigating this field. Future research should examine specific organizational processes applicable to using Heuristics, explore additional types of Heuristics that are common in structure across firms, and develop practical implications of Heuristics (Looock & Hinnen, 2015). Overall, the understanding of using Heuristics is still rather limited and mostly based on work by Bingham and Eisenhardt. Their work needs to be replicated in different settings, and thereby the theory of Heuristics as DC is further developed and elaborated (Looock & Hinnen, 2015).

Applicability of the Digital Transformation Context

Consequently, to advance the DC framework, it is necessary to investigate specifically Heuristics in currently scarcely studied contexts to identify differences and commonalities between TPS and EM. We argue that the DT environment represents an ideal candidate to execute such a comparison. Substantial empirical research has covered the necessity of DDC (Chirumalla, 2021; Ellström et al., 2022; Soluk et al., 2021; Warner & Wäger, 2019; Witschel et al., 2019; Wohlleber et al., 2022), confirming TPS's framework to be successful in the DT context. Matching Heuristics with DC in such a context thus proves to be a way to analyze the comparable concept to DDC in the case of Heuristics. This represents a promising undertaking for three reasons: (1) The context of DT is characterized by both uncertainty and opportunity abundance, fulfilling key prerequisites of the TPS and EM conceptualization of DC. Besides Krawinkler et al. (2022), (2) little research has covered Heuristics as EM's DC conceptualization in the context of DT, showcasing a need for further research. Finally, (3) if more insights about Heuristics are to be uncovered, a more granular comparison of the TPS and EM conceptualization is possible in the context of DT. **Figure 1** represents the Research Framework of this study, consolidating the Theoretical Background and Problematization.

Figure 1

Research Framework



Note. Question marks indicate knowledge gap this study addresses.

3.2 Study Setting

Applicability of the Consulting Industry

Having uncovered a research gap, it is suggestive to analyze an industry characterized by DT and by evidence of the use of DC. Another requirement is that DT provides both uncertainty and new opportunities in the selected industry, as this indicates the possible presence of DC according to TPS and EM. This would allow us to compare and possibly merge the two research streams.

Teece (2007) suggests that the following two characteristics of business environments favor the creation and integration of DC: First, the industry is fully exposed to the opportunities and threats associated with rapid technological change. Second, its value proposition must be adapted and recombined in response to new digital technologies to satisfy new customer needs. Considering these two points, the consulting industry proves to be an exciting choice for our study:

This industry is characterized by the need for firms to constantly explore and implement new ways to address new customer requirements and survive in the market in the long run (Sarvary, 1999). Consultancies must always identify opportunities and uncertainties before their clients do, which makes them particularly dependent on market changes. This is significantly enabled by integrating new digital technologies, which is seen as both an advantage and a challenge in the industry (Nissen, 2018). The value proposition of consultancies is the particular timeliness and appropriateness of the provided expertise. This requires the constant adaptation and recombination of the said proposition. Both characteristics mentioned by Teece are thus found in the consulting industry. The choice also proves to be optimal if we consider that it fulfills the requirement of showcasing uncertainty:

Glückler & Armbrüster (2003) state that uncertainty is more deeply anchored in consultancies compared to traditional industries. Specifically, two types of uncertainties characterize the industry: Institutional and transactional. Institutional uncertainty arises from the lack of formal standards within the industry, such as professionalization and service offering standards. This is due to the wide variety of clients from different industries, leading to a significant difference in consulting firms' value propositions. Transactional uncertainty, on the other hand, is a typical characteristic of knowledge-intensive services. The intangibility of project outcomes, and the interdependence between parties involved in consulting services create unpredictable situations. As a result, consultancies are faced with the unknown unknowns.

The assumptions of Heuristics are also consistent with the study setting of management consultancies. Importantly, Heuristics focus on strategic processes, not all of strategy (Bingham & Eisenhardt, 2014). This is because Heuristics are developed from the same canonical problems such as internationalization, acquisitions, alliances, and product developments (Bingham & Eisenhardt, 2011, 2014; Bingham, Eisenhardt, & Davis, 2007; Eisenhardt et al., 2010). Acquiring and delivering a consulting project can be seen as a reoccurring process similar to product development. When carrying out consulting projects, consultancies maneuver in uncertain environments with constantly varying demands of integrating AI and Data Analytics in that process. Therefore, the prerequisites for Heuristics are given.

Considering the previous, consultancies appear to be a recommendable setting for a closer look at investigating the capabilities organizations utilize in Digital Transformations.

Opportunities for practice

The identified knowledge gap also exposes opportunities for informing practice. Many DT initiatives fail to meet the desired outcomes (Tabrizi et al., 2019). Given the importance of businesses transforming successfully digitally, scientific findings can address this issue by first explaining what is happening (Bell et al., 2019). Second, by deriving practical guidance from these findings (Bell et al., 2019). Our study addresses both levers: First, as we aim to advance the framework of DC, we improve the explanatory power of this body of knowledge. Second, we strive to promote further details of DC and Heuristics in the context of DT, from which concrete guidance for practice can be offered.

3.3 Research Question

To sum up, the problematization in the previous sections has established that the theory of Heuristics in organizations and the Dynamic Capabilities framework at large needs further development and elaboration. This requires taking an explorative approach to add to mentioned framework. The consulting industry represents a suitable industry environment for this undertaking. We therefore ask:

How do Management Consultancies utilize Heuristics and Dynamic Capabilities in their approach to cope with the uncertainty and opportunities marked by Digital Transformation?

In doing so, the study aims to (1) generate scientific findings that develop and elaborate the frameworks of Dynamic Capabilities and Heuristics in organizations, thereby inductively building and elaborating theory. Additionally, (2) the study results should generate relevant and applicable findings for practitioners.

4. Methodology

After establishing this paper's aim and research question, we explain how to answer it. First, we derive the specifics of investigating Heuristics and Dynamic Capabilities, and the resulting methodological considerations in Foundation in Philosophy of Science (Chapter 4.1). Second, we present the Eisenhardt Method (Chapter 4.2) as an appropriate methodology to meet those considerations. Next, we shed light on the Case Selection (Chapter 4.3) through theoretical sampling. Afterward, we describe the procedure of Data Collection (Chapter 4.4) in the form of unstructured, qualitative interviews and archival data. Finally, we outline the Data Analysis (Chapter 4.5).

4.1 Foundation in Philosophy of Science

Based on the peculiarities of investigating Heuristics and DC, specifically the role of unobservables, this section will clarify the ontological and epistemological assumptions chosen to answer the research question. The goal of science is generally to observe and thereby verify components of theories. However, for some components, it is not possible to be observed (Godfrey & Hill, 1995). For example, in the RBV, the unobservability of resources is vital in assuring the inimitability of those resources and, therefore, the sustainability of the competitive advantage they provide (Godfrey & Hill, 1995). This unobservability especially applies to resources that are socially embedded or diffused throughout the organization (Godfrey & Hill, 1995; Rouse & Daellenbach, 1999). Therefore, DC are difficult to observe and measure, as well (Ambrosini & Bowman, 2009). While Heuristics are common in their structure across firms, the unobservable nature holds true for their idiosyncratic content. This is because Heuristics are socially embedded within organizations as “informal rules-of-thumb shared by multiple participants within the firm” (Bingham & Eisenhardt, 2011, p. 31). Taken together, a study of Heuristics and DC must recognize the difficulty of observing and measuring such constructs.

This circumstance requires specific ontological and epistemological considerations (Godfrey & Hill, 1995). If this study ought to guide managerial action, a belief that scientific theories can give us knowledge about unobservables without observing them is required (Godfrey & Hill, 1995). Instrumental positivists might accept unobservables as predictors for observable outcomes, as they do not consider the content but the form of such constructs. However, such theorizing will not provide insight into the nature of the unobservable construct and, therefore, not provide managerial implications based on them because positivists question the very existence of these constructs (Godfrey & Hill, 1995). Combining those aspects, if we intend to understand the content of Heuristics and DC specific to the context of DT, ontological and epistemological assumptions are required that imply that science can provide knowledge about unobservables.

Realism as a research paradigm fulfills these requirements and therefore represents a viable research paradigm for this study. Ontologically, realism assumes that there is an objective reality. Epistemologically, realism assumes modified objectivism, recognizing that human perception and interpretation play a role in our understanding of reality (Bell et al., 2019). Hence, realism emphasizes that reality exists independently

of human perception and that there are objective facts about the world that can be discovered through empirical inquiry. However, it also acknowledges that our understanding of reality is always partial and subject to revision as new evidence emerges (Bell et al., 2019; Boyd, 1991; Christie et al., 2000). Therefore, realism tries to work towards getting as close as possible to understanding reality by triangulating many sources (Christie et al., 2000). Said triangulating allows for combining many different perspectives to complete an accurate picture of reality. Ultimately, a realist tries to advance theory to the degree that science can measure and observe previously unobservable constructs (Godfrey & Hill, 1995).

In this manner, it is possible to investigate DC and Heuristics, even though they entail unobservable aspects. This is because the “evidence that we have that such entities exist independent of our theorizing about them is not based upon observation of the entities themselves, since they are unobservable, but upon observation of their effects” (Godfrey & Hill, 1995, p. 525). Therefore, adding to the already established aims of the study in Chapter 3.3, a method that (3) pays more qualitative attention to detail to gain a better understanding of the firm and context-specific characteristics of capabilities is required (Ambrosini & Bowman, 2009; Lockett et al., 2009). Additionally, (4) the methodological approach should emphasize triangulation, that is, investigate several unique perspectives on the firm level (Godfrey & Hill, 1995). Finally, (5) it should ultimately develop observable theoretical constructs to observe unobservables (Godfrey & Hill, 1995).

4.2 Eisenhardt Method

In summary, the theoretical approach of this study should (1) allow for the inductive building and elaboration of the DC framework, (2) generate practically relevant and applicable findings for practitioners, (3) pay qualitative attention to detail, (4) include several, unique perspective through triangulation, and (5) ultimately develop observable theoretical constructs.

The Eisenhardt method represents a well-suited methodological approach to meet these requirements, as argued for in the following (Ambrosini & Bowman, 2009; Christie et al., 2000; Eisenhardt, 1989; Godfrey & Hill, 1995; Lockett et al., 2009). The Eisenhardt Method is a multi-case induction approach for conducting research with qualitative and/ or quantitative data on complex phenomena in organizations and building theory (Eisenhardt, 1989, 1991, 2021; Eisenhardt & Graebner, 2007; Eisenhardt et al., 2016). It can be utilized in various research paradigms (Eisenhardt, 2021). At its core, this method involves studying multiple cases of organizations that are similar in some ways but different in others. By analyzing data, the ultimate goal is to identify patterns or themes that can help explain the underlying phenomenon, form hypotheses about them, debate their interconnections, and compare gained insights to conflicting and similar literature. Thus, resulting in sharpened internal validity, generalizability, and construct definitions (Eisenhardt, 1989). Such data-grounded research can offer meaningful insights for practitioners (Glaser & Strauss, 1967; Locke, 2001).

Overall, the Eisenhardt Method allows to (1) build and elaborate theories, (2) generate practically relevant and applicable findings for practitioners, (3) include qualitative data, (4) triangulate via different cases and

forms of data, and (5) to develop observable theoretical constructs. Hence, the Eisenhardt Method is suitable for this study's aims and specific considerations.

4.3 Case Selection

Based on the study setting of digitally transforming management consultancies, we selected five management consultancies with presences in four different European countries. Relying on five case companies pragmatically align with our capacities and Eisenhardt's (2021) proposition, that four to ten cases per study are common and work well. The focus on European offices was based on the international background of the researchers as an opportunistic rationale (Bell et al., 2019). This process was guided by theoretical sampling and a common process case design (Eisenhardt, 1989, 2021). Therefore we chose management consultancies that indicate similar processes regarding their AI and Data Analysis adoption. In addition, we selected case companies based on differences in size, expertise area of their consulting services, and main client base. Further, we chose offices from varying regions with cultural differences (Hofstede, 2001). The comments in **Table 1** regarding the digital self-awareness of the selected cases offer further insight into the respective companies.

Table 1

Case Company Overview

	Case Companies				
	G1	D1	S1	G2	A1
Office Location	Germany	Denmark	Sweden	Germany	Austria
Office Founded	1990s	1990s	1980s	1960s	1990s
Global Head Count	< 1,000	< 1,000	1,000 - 2,000	3,000 - 4,000	1,000 - 2,000
Number Global Offices	10 - 20	10 - 20	30 - 40	60 - 70	40 - 50
Global Revenue	< 1 Billion €	< 1 Billion €	> 1 Billion €	> 1 Billion €	< 1 Billion €
Expertise Area	Strategy & Operations	Strategy & Transformation	Strategy & Financial Services	Strategy & Operations	Strategy & Technologies
Comment on Digital Self-awareness	"I bet the other consultancy firms have different takes on that right? Generative AI. Yeah, we're not hugging it." <i>Head of AI & Data Analytics G1</i>	"So the fact that we have internally already embraced this agenda and are talking strategically about the use for our own business, means that we can a kind of more relevantly and also with the higher authority go out and advise clients on it." <i>Senior Consultant D1</i>	"As you may know, it's very fun to be around those technologies, but it's quite dangerous. I would say from a consulting perspective [...] it's blowing up in terms of actors and players providing the technologies." <i>Manager S1</i>	"I mean, digital transformation has been always a super important topic. [...] And in consultancies as well, as (some earlier some later) saw the need to you know, also 'walk the talk' internally and what they do on the client side, namely being at the frontier of digital thinking." <i>Manager G2</i>	"We're really good at consulting other firms on how to use these things, but we're really really bad and using them on our own." <i>Manager A1</i>
Main clients	Automotive & Industrial Goods	Pharmaceuticals & Consumer Goods	Retail & Consumer Goods	Retail & Consumer Goods	Telecommunication & Engineering

4.4 Data Collection

To meet the established demands for more qualitative detail when investigating DC and Heuristics, we used interviews and archival documents as the data basis of our study. Interviews represent self-reported data that can be collected in both structured and unstructured ways (Bell et al., 2019). While in structured interviews, each participant is asked identical questions, unstructured interviews are more open-ended and resemble a conversation.

According to Bell et al. (2019), one disadvantage of unstructured interviews is that they have low reliability and allow only limited generalizability. Highly structured interviews, on the other hand, can blind the researcher to the phenomenon being studied (Miles et al., 2014). Furthermore, pre-structured interviews can only capture aspects of the research subject that have been considered in advance. Exploratory studies, such as this paper, aim to reveal new aspects. In addition, unstructured interviews allow the researcher to create a more casual and natural conversational situation in which more extensive responses of greater substantive importance can be given, leading to richer data (Bell et al., 2019). Last, pre-structured instruments are often separated from the context of the research subject (Miles et al., 2014). The goal here is to achieve generalizability across many different cases. However, as noted before, this study aims at understanding a concept in the specific context of DT. We, therefore, chose the method of unstructured instead of structured or semi-structured interviews for this study.

Unstructured interviews have an overarching data collection goal (Bell et al., 2019), but questions are only preformulated to a limited extent before they are carried out. Detailed preparation is nevertheless necessary. In the following, the process of data collection and ethical aspects are described.

Process of Data collection

We selected interview partners from varying hierarchical levels within consultancies (i.e. Consultants, Managers, and Partners) with experiences connected to DT, AI, and Data Analytics. This, again, assured the triangulation of data while keeping the study context consistent. Guidelines for unstructured interviews based on Miles et al. (2014) ensured a methodically correct approach, maintaining flexibility. Furthermore, since data collection and research in general always have ethical consequences, particularly in the organizational context, we collected data using ethical guidelines following King et al. (2019). An information sheet with consent forms for participants ensured compliance with these ethical considerations. The information sheet can be found in the appendix. We started interviews with information about the research project, ourselves, and the confidentiality of the interview for the participant to build rapport between us and the participant (Bell et al., 2019). The central part of the interview began with a prepared introductory question (Miles et al., 2014). Through this impetus, interviewees continued to lead the conversation independently and moved away from the first question. Here, it was also helpful that our research project's goal was stated at the beginning of the interview, thus creating a content framework for the conversation. After that, we primarily took on the role of active participant listeners. Here, we used elaboration, clarification, and completion questions as probing

questions (King et al., 2019). Finally, we used a prepared open-ended question to end the interview. This question often produced rich statements and was therefore used in every interview. A list consisting of the initial introductory, exemplary probing, and the closing question can be found in the appendix.

Besides this interview data, we collected archival data. As consultancies publish whitepapers communicating insights from industry and technology, the study setting allowed for data triangulation in accordance with Bell et al. (2019). Especially in light of the short time frame of this study, relying on archival documents from multiple years allowed us to add richness to our data. However, whitepapers primarily focus on success stories, therefore hinting at a survivor bias. As these documents represent a tool to sell services, a critical stance on the objectivity and credibility of such data needs to be considered. We obtained those documents through the companies' websites and interview partners. Guided by the research question, promising documents were selected.

Table 2 offers an overview of the collected interview data. A total of 18 interviews were conducted for this study. The shortest lasted about 20 minutes, and the longest about 49 minutes. The average duration of the interviews was 33 minutes. In total, we conducted 606 minutes of interview data. **Table 3** summarizes the collected archival data. A total of 23 whitepapers were collected, totaling 484 DIN A4 pages of digital material.

Table 2

Interview Data Overview

Company Synonym	Role	Date	Duration in Minutes
A1	Manager	11.04.2023	34
	Consultant	27.03.2023	27
D1	Senior Consultant	06.03.2023	30
	Senior Consultant	29.03.2023	40
	Senior Consultant	30.03.2023	47
	Senior Consultant	04.04.2023	30
	Senior Consultant	12.04.2023	31
G1	Consultant	01.03.2023	20
	Associate Partner	08.03.2023	25
	Associate Partner	14.03.2023	30
	Senior Consultant	23.03.2023	40
	Head of AI & Data Analytics	17.04.2023	40
G2	Manager	31.03.2023	35
	Manager	04.04.2023	28
	Manager	05.04.2023	36
	Manager	11.04.2023	30
S1	Manager	21.03.2023	34
	Manager	22.03.2023	49
Grand Total	18		606

Table 3*Archival Data Overview*

Company Synonym	Number of Documents	Number of Pages	Page Average	Oldest Paper	Newest Paper
A1	4	65	16	2021	2023
D1	16	42	3	2023	2023
G1	6	108	18	2019	2021
G2	6	95	16	2019	2022
S1	6	174	29	2020	2023
Grand Total	38	484	13	2019	2023

4.5 Data Analysis

Our qualitative data analysis aims at developing concepts that represent perceived patterns in the data (Locke, 2001). This section of the paper describes how the collected data was analyzed and evaluated for theory building. The instructions by Eisenhardt (1989) and Miles et al. (2014) guided this process. Building on these sources, we constructed an analysis procedure in four steps.

We summarized cases in comprehensive descriptions in the first step (1). Thereby, we got familiar with the individual cases, mitigating the risk of arriving at premature conclusions from data across different cases (Eisenhardt, 1989). Next (2), after transcribing the interviews we inductively coded our data. The conceptual framework of the research question guides this process. We used three aids to improve the analytical quality: First, a coding method that supports the formation of inductive codes based on Miles et al. (2014). Second, reflection questions that enhance creativity in the coding process (Eisenhardt, 1989; Miles et al., 2014). Finally, memoing procedures that collect one's thoughts and support the data analysis by curbing human biases (Eisenhardt, 1989; Eisenhardt et al., 2016; Glaser & Strauss, 1967; Miles et al., 2014). The codes we formed in this way were not rigid but evolved (Miles et al., 2014). For this study, we renamed, split, and merged codes. Finally, we (3) integrated the resulting codes into higher-order constructs in the third step. The goal here is to summarize and combine multiple codes into a smaller number of constructs (Miles et al., 2014). Specifically, we consolidated 288 inductive codes into nine theoretical constructs. Thereby, we moved away from a mere description of the data and arranged categories so that they begin to add up to a conceptual whole and form our theory of what happens in the observed cases. In doing so, we established the relationships between the emerging theoretical constructs and the arguments of why and how they are connected (Eisenhardt, 1989, 2021; Eisenhardt & Graebner, 2007; Eisenhardt et al., 2016). We substantiated and validated our thoughts with excerpts from the data. In line with the triangulation efforts of this study, we integrated our codes into case-spanning constructs by analyzing data within and across cases (Eisenhardt, 1989). Finally, (4) we completed the emergent theory by integrating it and comparing it with existing literature. "Overall, tying the emergent theory to existing literature enhances the internal validity, generalizability, and theoretical level of theory building from case study research" (Eisenhardt, 1989, p. 545). Therefore, in this thesis's results section, we reference theories and results of other research. Ideally, the analysis and collection of data are concluded when theoretical saturation is achieved (Eisenhardt, 1989; Glaser & Strauss, 1967). Although many insights were repeated

in the data at the end of our study, it remains debatable whether we have achieved full theoretical saturation. The entire analysis process was conducted using the web version of the qualitative data analysis program ATLAS.ti.

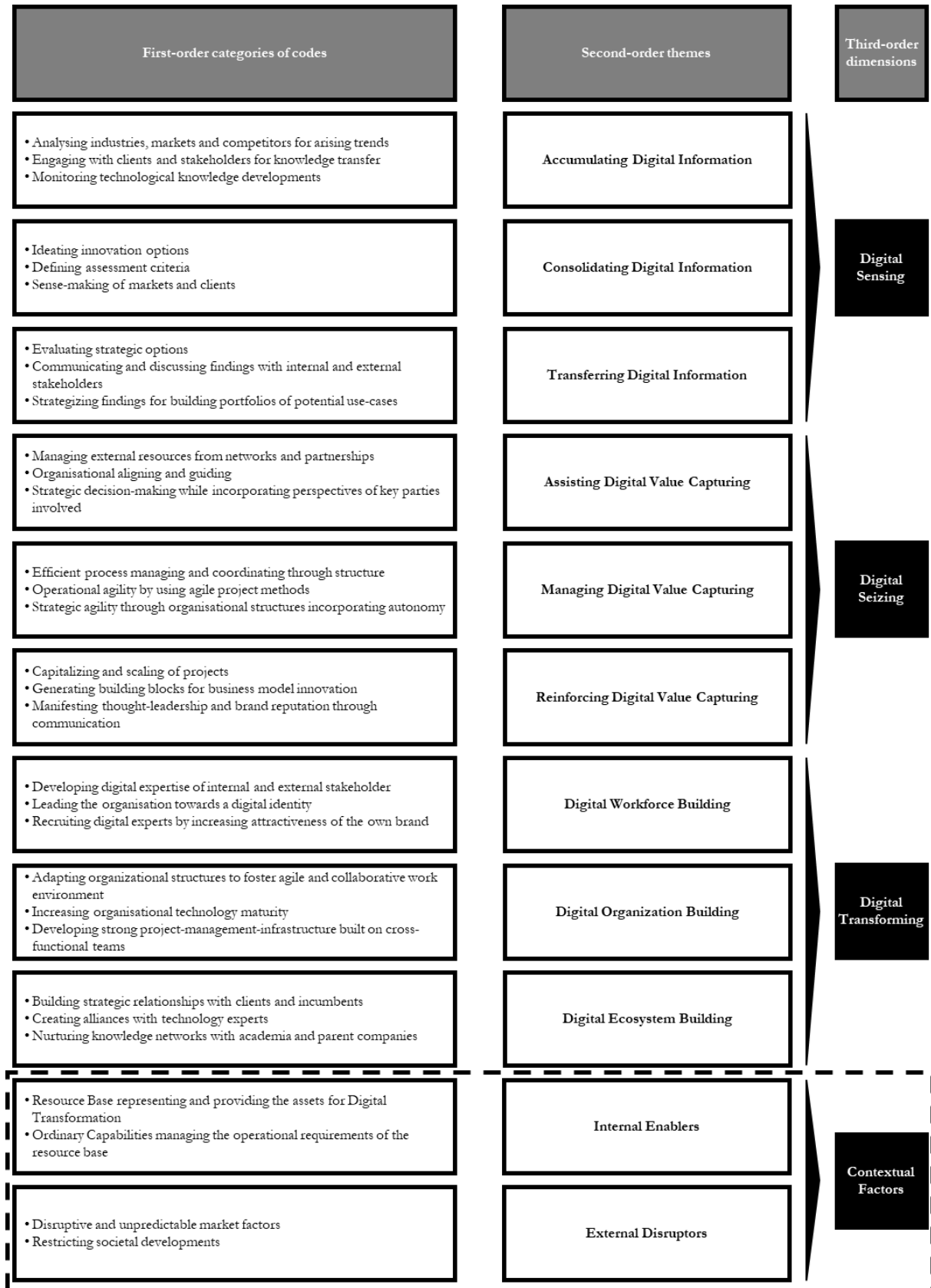
5. Results

After describing the scientific process to answer the research question, we present the conceptual categories of inductively derived codes in two steps. Our qualitative data analysis revealed the presence of both, Digital Dynamic Capabilities and Digital Heuristics. Therefore, in the first step, we address the emergent findings concerning Digital Dynamic Capabilities (Chapter 5.1) and related management consulting-specific insights (Chapter 5.2). In the second step, we present the emergent findings regarding Digital Heuristics, particularly their relationship to Digital Dynamic Capabilities (Chapter 5.3). Again, we highlight aspects specific to consultancies (Chapter 5.4).

5.1 Emergent Findings regarding Digital Dynamic Capabilities

A closer analysis of the investigated companies demonstrates the development and the use of DDC, specifically Digital Sensing, Digital Seizing, and Digital Transforming. These themes were consistent with previous research on DDC and further supports their existence in practice. In particular, we present nine microfoundations subject to DC that deal with DT. The Digital Sensing Capabilities of Accumulating Digital Information, Consolidating Digital Information, and Transferring Digital Information. Furthermore, the Digital Seizing Capabilities of Assisting Digital Value Capturing, Managing Digital Value Capturing, and Reinforcing Digital Value Capturing. Finally, we discuss the Digital Transforming Capabilities of Digital Workforce Building, Digital Organization Building, and Digital Ecosystem Building. This newly created approach for consolidating the different types of microfoundations is based on the concept of DDC, which involves various fundamental components. This structure is consistent with the perspectives presented by authors such as Warner and Wäger (2019), Chirumalla (2021), and Witschel et al. (2019).

The data structure of first-order concepts, second-order themes, and aggregated third-order dimensions are presented in **Figure 2** which consolidates the data on DDC accumulated through our interviews and archival data of the five case companies.

Figure 2*Digital Dynamic Capability Data Structure*

In addition to the capabilities themselves, the diagram showcases contextual factors, which, based on the analysis of conducted data and the comparison to existing literature, can act as disruptors and enablers of companies' D'T. In the following, we will go into the conceptualization of the Contextual Factors.

Contextual Factors affecting Digital Transformation

Our findings reveal that contextual factors are critical in affecting the DT within organizations. We found explicitly that the ability to build and sustain these processes is not solely dependent on the firm's capabilities but that circumstantial variables are also significant in shaping a firm's approach to transforming its business model digitally. This asserts research by Leih et al. (2015) that market environments directly relate to firms' proprietary resources and capabilities and that those assets impact organizations' business model innovations. Now, before presenting findings regarding DDC, we explain the Contextual Factors across case-companies and their respective importance. **Table 4** consolidates the data structure of Contextual Factors with exemplary quotations on which they are based.

Table 4

Contextual Factors Data Structure with Exemplary Quotes

Contextual Factors		
Second-order themes	First-order categories	Exemplary Quotes
Internal Enablers	Resource Base:	“So for example, for Metaverse, we managed it with one of our Saudi Arabian clients. mean, no other client had the money or the time to look into this topic, but they did. So we moved in, and we moved quickly, which gives us I believe, a great advantage over any other clients. Most of them I think will kind of look at the topic at a later stage because it's not on that top priority list right now. But we have project experience and we've worked with these technologies, and we've worked with clients, and we have a success story. So I think that should be the key or is the key strategy for generative AI right now. So we're we developed a calling card, some sort of very basic service offering, where we promote our expertise in the field based on all the different sorts of pools of experts we can retrieve from the [mother firm] and our network. And the next job will be to take those calling cards to potential client cards and then we see if they have the money or the interest to try such technology and that is very, usually a very personal executive decision.” <i>Manager G2</i>
	Financial Assets	
	Intellectual Property	
	Workforce	
	Authority & Expertise	
	Brand & Reputation	“But one final reason why we're building: We need the experience, we need the case. It's a pretty rare thing in management consultancies. But in this particular case, senior leadership has said, we want to say we built this thing. We need to tell clients that we can do it. And right now it takes too long to convince them to do it. So we're just doing it ourselves.” <i>Senior Associate D1</i>
	Culture	
	Leadership support	“We enable our colleagues to use more methods and tools through training. Already starting this year, also with the newcomers, we are integrating certain cases in training weeks. It is a three-week-long onboarding phase, and we also incorporating analytics right into these three weeks. And so overall, we want to make sure that at least some exposure to these topics is there.” <i>Associate Partner G1</i>
	Organizational Structure:	
	Ordinary Capabilities	“They set clear processes for data governance, compliance, and security, and they develop a common taxonomy, data access controls, and standard processes and data schema.” <i>Whitepaper S1</i>
	Data Governance	
	Data Infrastructure	

Contextual Factors		
Second-order themes	First-order categories	Exemplary Quotes
External Disruptors	Unpredictable market factors:	“There was a massive change due to the launch of chatGPT in November. So I attended the CIO conference that we host every year. And for this year, the main topics were not what we have prepared. So at the summit, it's a get-together of CIOs, coming together from all over Europe, discussing current issues, and we prepared stuff around cloud security, supply chain resilience, business, and transformation. However, every single CIO asked about do we do about AI. What does chatGPT mean for our business model because it's all over the news?” which was quite exceptional for such a small tool and such a sort small topic on a CIO agenda to have such great attention.” <i>Manager G2</i>
	Client	
	Competition	
	Technological development	“So I think that open AI is the biggest thing that has happened for years. I this will change everything. I'm so sure about that. I'm not just too sure that we're in a state right now where we know how to use it, why use it? Are the clients ready to use it? As of now, you know, this is quite far in terms of the clients. You know, most of the clients that I work with, they're still in the 90s. They're still exploring RPA now, and that is basically what came up 10 years ago. They haven't reached a normal AI phase.” <i>Manager S1</i>
	Restricting societal developments	
	Regulations	

Internal enablers

The empirical analysis identified intra-firm enablers that drive the DT of organizations. In particular, we found that a firm's resource base and ordinary capabilities shape these enablers.

The resource base, for example in the form of financial resources, is identified as an important enabler of DT. Companies with sufficient financial resources are better able to invest in technologies, hire qualified employees and build the necessary infrastructure to drive their digital journey. This echoes existing statements in academia emphasizing the importance of complementary resources, such as financial assets (Helfat, 1997; Helfat & Raubitschek, 2000; Teece, 2007). Furthermore, businesses indicate that possessing enabling resources facilitates one's ability to compete.

“I think other consultancies are partially a bit further ahead in what they're doing. So [competitors], they're doing a lot of such as just putting a data scientist next to the consultant and then delivering the project. But I think every consultancy is, at the moment, recognizing the importance of Data Analytics and trying to do something there. It's just that they're bigger and they have more money. They've also been able to invest in that kind of project. [Competitors] are a lot bigger and therefore just have more financial possibilities.” *Manager G2*

In line with Teece (1986), we further address the importance of intellectual property (IP). The enabling capability of IP is essential to safeguard innovations better and create successful revenue streams from digital initiatives.

“[Firm's] state-of-the-art analytic approaches begin detecting dependencies and anomalies at a speed impossible for humans.” *Whitepaper G1*

However, IP alone is insufficient to distinguish a company from the competition in the long term, as additional complementary assets are needed for this. For instance, the workforce was identified as a crucial asset for the companies analyzed, given their claim that digital experts foster their DT. A similar

observation is made by Schultz (1993), who emphasizes that having a capable workforce not only directly impacts the economic growth of a company but also stimulates the creation of new know-how, another enabling resource. In addition, the workforce can provide a firm with a culture of innovation (Warner & Wäger, 2019). According to a Manager at S1, this will be one of the decisive factors for the competitiveness of companies in the future, which is why he is expecting a real war for talent.

“So we have been working with that a lot on how to attract the right profiles and we are certainly not there. If we are going to consult managements, most of the profile should understand these new technologies in like 10 years.” *Manager S1*

Firms proposing to have a culture of innovation and showcasing future-oriented thinking communicate having more success in their DT initiatives. This finding is supported by Bock et al. (2012), who consider the working culture in a company to be an elementary component for further business advancement. Furthermore, a flexible organizational structure supporting cross-functional collaboration was found to be essential in enabling value-generating DT.

“[Company] also had the expertise and flexibility to guide [client] through the entire process, from the initial assessment, planning, pilots and showcases, the set-up of data models as well as the implementation and rollout of individual practices.”

Whitepaper G1

This finding is congruent with previous statements considering a company’s organizational structure as a factor influencing its competitive success (Bustinza et al., 2015; Douglas & Judge, 2001). More specifically, it is noticeable that authority and expertise are resources that have a key impact in enabling the DT of organizations. Firms that have dedicated teams with the necessary know-how to support digital projects are not only able to satisfy customer needs but also contribute to the development of a strong brand reputation, as knowledgeable employees can provide high-quality products or services and effectively communicate the organization’s values to customers. This increases new value creation opportunities. A Manager at G2 describes this phenomenon as successful projects serving as “calling cards” for future clients. Using brand reputation as an enabler to differentiate oneself from competitors in the market strategically mirrors existing theories claiming that this entity can also be considered an intangible resource on which increased value capturing can be built (Hall, 1993; Herbig & Milewicz, 1993).

Our analysis also revealed a second internal enabler category: Ordinary capabilities. Ordinary capabilities allow firms to manage the operational requirements of their resource base (Ambrosini et al., 2009; Teece, 2023). For example, a company’s data infrastructure and governance allow for more effective use of data, making better-informed decisions. Teece (2023) highlights that firms require capabilities concerned with governing the established resource base.

“They set clear processes for data governance, compliance, and security, and they develop a common taxonomy, data access controls, and standard processes and data schema.” *Whitepaper S1*

Hence, data governance and infrastructure can be seen as internal enablers, as these preserve the resource base that is particularly relevant in the DT context.

External disruptors

When looking at the case companies, disruptors such as market and societal changes were identified as having a significant impact on the DT of companies. The former type of disruptors refers to the various changes occurring in an organization’s environment, such as client demand, technological trends, or the competitive landscape, causing client expectations and preferences to constantly shift, which can have a huge impact on the DT process of organizations.

“Well, our clients are more and more interested in data analytics, and it’s growing significantly. We see that basically, it’s also relevant to every project. We have on the one hand specific data and analytics projects that go into organizational topics or implementing a certain tool.” *Manager G2*

These market factors correspond to Knightian uncertainty (Watkins & Knight, 1922) and are described by a Manager at S1 as “quite dangerous” due to their unpredictability. Precisely this phenomenon has the potential to disrupt the success of an organization in the future. In addition, restrictive social developments are increasingly emerging and gaining relevance as disruptors. For example, regulations as external factors imposed by governments can significantly influence the DT of companies.

“There will be some barriers and the improvements stop: Regulation happens or there will be limitations to the current way these technological models are built, but so far, it's looking like the current Digital Transformation is going to be very, very disruptive.” *Senior Consultant D1*

These disruptors are constantly evolving and changing in their maturity and speed of change. For example, the development of new technologies can initially disrupt an industry but become more widely adopted and normalized over time, leading to new opportunities and challenges for firms. Those observations were echoed at S1 regarding robotic process automation and at G1 and G2 in regard to machine learning when both technologies disrupted the markets as they gained traction. Similarly, regulatory changes can be slow to implement but can profoundly impact firms and their DT journey. Existing literature highlights the effect technology regulations can have on companies or entire markets and how capabilities can help companies to relative such effects (Freij, 2022; Sköld et al., 2020; Teece, 2007). Overall, Sensing both the internal enablers and the external disruptors are crucial for firms to successfully transform digitally and leverage these factors to drive growth and innovation.

Digital Dynamic Capabilities affecting Digital Transformation

Now that the factors influencing the DT of companies are setting the stage for the uncertainty and exploitation of digital opportunities, we will turn to DDC. These capabilities are designed for the very purpose of dealing with the uncertainties and opportunities evoked by DT. Here, we detail the respective microfoundations for each DDC component and begin with Digital Sensing.

Showcasing Digital Sensing Capabilities

Looking at the identified Digital Sensing Capabilities, a pattern of recurring goals emerges across company boundaries, which are to be facilitated by these capabilities. For one, Digital Sensing Capabilities should serve those firms to identify new business opportunities ahead of the competition. Furthermore, those capabilities should allow customers and external stakeholders to be integrated into the ideation phase. This is connected to another identified requirement because of which the investigated companies showcase their Digital Sensing Capabilities: To model value propositions and value-capturing mechanisms to capitalize and monetize their findings. These insights reflect the argument of the proponents of DC. Namely that, especially in fast-paced and competitive environments, companies need to demonstrate the ability to identify and profit from opportunities through Sensing Capabilities (Hess et al., 2016; Teece, 2012; Teece et al., 1997).

As one company asserts, they are surrounded by an abundance of opportunities, and one only has to explore and exploit them.

“Examples from various industries describe tangible business benefits, demonstrate cross-transfer potential, and outline how to avoid the most common pitfalls.”

Whitepaper G1

The capabilities revealed here to interact with stakeholders to uncover potential digital value capturing opportunities is the equivalent of knowledge transfer. According to Teece (2007) transferring know-how is an ideal Sensing Capability to provide a better understanding of the business environment. Our analysis shows that firms demonstrate the following three sequential capability microfoundations to achieve those goals while showcasing Digital Sensing: Through Accumulating Digital Information to gain an understanding of the market, Consolidating Digital Information can take place, which is used for sense-making, building on which the insights are communicated to relevant stakeholders, namely utilizing Transferring Digital Information. **Table 5** presents the Digital Sensing data structure with sample quotes taken from our empirical data.

Table 5

Digital Sensing Data Structure with Exemplary Quotes

Digital Sensing		
Second-order themes	First-order categories	Exemplary Quotes
Accumulating Digital Information		“As advanced economies continue their transition from physical production to services and intangible assets, the importance of information has never been greater. More and more organisations are thinking about how they harness the power of data analytics, artificial intelligence and ‘big data’ and how they can make significant investments.” <i>Whitepaper G2</i>
	Analysing industries, markets and competitors for arising trends	“We’re doing the same as we’ve done with the AI agenda for years, namely saying ‘This is so disruptive, you should do some AI and we should do something with it.’ And you have to be very mindful of that approach. The way or the area where I think it still becomes a bit valid when we’re talking generative AI is when you see studies like the one from MIT. If we’re seeing a 40% increase in productivity, then that’s a kind of business problem for everyone. It’s not a sector-specific or company-specific thing. If activity and productivity increase, it is something that you can leverage almost everywhere”. So it’s more a bit of a justification, but it is a paradox to say, ‘Here’s my AI hammer, where is my nail and where am I supposed to be using this tool? And I think, generative AI is so new, that everyone is still also figuring out, how to best use it and that’s also why it’s a bit more an explorative approach at the moment.” <i>Senior Consultant D1</i>
	Engaging with clients and stakeholders for knowledge transfer	
	Monitoring technological knowledge developments	“The [Firm] Center for Integrated Research (CIR) offers rigorously researched and data-driven perspectives on critical issues affecting businesses today. We sit at the center of [Firm] industry and functional expertise, combining the leading insights from across our firm to help leaders confidently compete in today’s ever-changing marketplace.” <i>Whitepaper S1</i>
Consolidating Digital Information		“We’ve done webinars for external stakeholders and now also kind of like a roadshow here in Norway specifically, where we are diving things we have. We’re also in dialogue with several companies about potential pilot projects. So where we were taking an approach where we have an inspirational session to talk about the possibilities within AI and then how we can help them accelerate the impact of generative AI.” <i>Senior Consultant D1</i>
	Sense-making of markets and clients	
	Defining assessment criteria	“Given the wide applicability of AI, one of the biggest obstacles is choosing where to start and which use cases to prioritize. Companies may ask: What will work best for the business? Where are our competitors investing? What are the likely “must-win battles” based on the experiences of more advanced sectors? To provide answers to these questions, we used results from our global, cross-industry survey to develop a heat map, highlighting the types of data used most often and the insights companies are benefiting from. The data also reveals major differences in AI proficiency between industries and shows sector-specific focus areas.” <i>Whitepaper A1</i>
	Ideation of innovation options	“You have two types of innovations, right? You have incremental innovations and then you have breakthrough innovations, right? And right now we are in this kind of time period where this is a breakthrough moment.” <i>Manager G2</i>
Transferring Digital Information		“[Firm] is working on a variety of projects exploring the opportunities and business value Generative AI can create for our clients. From experiences and conversations thus far, the clear path ahead, as with all AI, is to attempt to discover and capitalize on capabilities while also responsibly managing the risks that are already emerging.” <i>Whitepaper S1</i>
	Strategizing findings for building portfolios of potential use-cases	
	Evaluating strategic options	“Leveraging data is not always about revenue generation, organisations can use data strategically to reduce costs through better planning and optimisation of operations, as well as reducing and managing risk. Examples of cost reduction strategies include using data to enable better management of customer credit, reduced fraud risks and sharing data with suppliers to optimise inventory management and improve working capital in the supply chain. Cost reduction initiatives tend to be more certain investments than revenue growth.” <i>Whitepaper G2</i>
	Communicating and discussing findings with internal and external stakeholders	“This [paper] shares the results of a [Firm] survey, inviting more than 500 experts and industry executives to gauge their views on critical uncertainties and future scenarios; to draw conclusions on technology maturity, pace, and impact; and to help illustrate what this might mean for potential business cases.” <i>Whitepaper A1</i>

Accumulating Digital Information

The first Digital Capability microfoundation serves to identify market dynamics at an early stage in the volatile environment of consulting firms, as a Manager at G2 describes it, to obtain enough relevant information to identify opportunities.

“I mean, at least if I look back at the last 15 years of new technologies being adopted, I’ve never seen anything like ChatGPT in terms of market traction, so I think it’s only a matter of time until the next thing comes around and we have to be aware of it.”

Manager G2

This is done by analyzing industries, markets, and competitors for emerging trends, with a particular focus on engagements with clients and stakeholders.

“It is fair to say that AI applications have not yet become as commonly used as many had predicted, with a recent [firm] survey showing that only 16% of AI users believe they are gaining full potential from their use of it. In many organizations, AI applications remain stuck at the pilot stage, or else are limited to specific applications such as customer interaction and intelligence. More widespread adoption of AI for key management decision-making is often hindered by the lack of an adequate strategy.” *Whitepaper A1*

The customer integration approach that is described reflects the involvement of clients in the adaptation and optimization of the current business model, a Sensing Capability (Teece, 2007, 2010), as a way of understanding their needs and their ability to integrate digital value offerings. This example of a detailed assessment of market potentials also illustrates the monitoring of technological knowledge, in this case on the client side. By leveraging these capabilities, organizations can anticipate significant trends and pinpoint market gaps that present promising value-creation opportunities.

Consolidating Digital Information

The second type of microfoundations incorporated in Digital Sensing deals with the sense-making of market developments, their processing, and creating assessment criteria based on which feasible innovation options are to be designed. The processing of information can refer to the clients of the company, the behavior of competitors, but also to new technologies.

“I would turn to some new joiners, someone at the bench to kind of see, if they can have some time over to put some effort into the product, maybe to grab a certificate and study interesting technologies to understand the pros and cons of it.” *Manager S1*

Teece (2007) describes this sense-making of a potential digital business model extension as the part of Sensing Capability where a company interprets new market developments and assesses how valuable a new technology is. Here, the interaction with the client is critical to understand their needs, their behavior, and, thus, new value-capturing opportunities. According to G1’s Associate Partner, the continuous integration of client feedback as well as having a “client-first focus” is the key to conceiving potential projects in the ideation phase, ultimately creating value for both the client and the company. This statement is congruent with existing theories indicating that integrating clients in the product development

phase leads to success. Teece (2010, 2018) argues for example that a strong understanding of the client's needs is key to successful business models.

Transferring Digital Information

The last microfoundation of the Digital Sensing Capability serve to strategize the findings accumulated to date for building potential use cases. The goal with the capabilities found here is to tailor value propositions based on the collected knowledge, which organizations can build on to capture value. There is also a need to communicate collaboratively with internal and external stakeholders about the current state of knowledge and to discuss it together to obtain the most meaningful evaluation of the strategic options available.

“We’ve arrived at this year’s trends through both primary research and our lived experience, interviewing both industry and public sector leaders who have developed innovations in everything from resilient manufacturing to digital and biometric credentialing.” *Whitepaper S1*

This example corresponds to the requirement described by Zott et al. (2011), namely, while seeking new value offerings to actively engage in dialogues with stakeholders, not only customers. Here, whitepapers can help to communicate the realizable value capturing clearly. The case companies additionally showed the ability to simplify decision-making with the collaborative approach and signal organizational thought leadership. This represents Sensing Capabilities of creating a climate of open communication and signaling that the respective organization strives for joint value creation (Feiler & Teece, 2014). Since all five companies have their idiosyncratic procedures for Sensing changes in the market, customer needs, and technological advancement compatible with the theory of DC in current scientific publications, it can be said that Digital Sensing Capabilities are present in the analyzed organizations. Those identified Digital Sensing Capabilities mesh seamlessly with the now following capabilities we identified in the companies studied, which address and actively leverage the uncovered digital business opportunities, namely Digital Seizing Capabilities.

Showcasing Digital Seizing Capabilities

To maximize the potential of both new digital value prospects and current resources, our analysis has identified the following capability microfoundations inside organizations: By Assisting Digital Value Capturing, access to internal and external enablers is established, through which firms can start Managing Digital Value Capturing, whereby Reinforcing Digital Value Capturing aims to spread and consolidate captured value within the organization.

Based on our analysis, the five organizations we reviewed use Digital Seizing Capabilities for two main objectives: First, to exploit existing agility and responsiveness and to make efficient and effective use of current resources and processes. Second, to promote innovation and increase attractiveness towards customers. In the latter case, Digital Seizing Capabilities are intended to help organizations, to drive

innovation by pursuing new opportunities that lead to the development of new products, services, or business models even if they do not have prior knowledge in those areas.

“I say a perfect project approach doesn’t exist and it’s just about doing something and learning. And it’s hard. The Digital Transformation is happening at such a speed that we can’t keep up.” *Senior Consultant D1*

Pursuant to Teece (2007), those identified capabilities reflect Seizing Capabilities through the action intentions to address opportunities by maintaining, expanding, and exploiting existing competences and assets as needed. **Table 6** presents the Digital Sensing data structure with sample quotes taken from our empirical data.

Table 6

Digital Seizing Data Structure with Exemplary Quotes

Digital Seizing		
Second-order themes	First-order categories	Exemplary Quotes
Assisting Digital Value Capturing	Managing external resources from networks and partnerships	“Changing the current business model and offering ready-to-use IT tools is indeed attractive. But the question is what do you want to be as a consultancy, right? And that’s the big question I think, that senior leaders or consultancies will be thinking about because you’re very strongly connected to your clients. But at the same time, Asset-based-consulting is just a very different business model. It has different margins. And it might also make you a little bit less focused in terms of the kind of culture that you want to have as a firm. That is such a very different value offering compared to our current one. And it’s like a big debate, in which direction we are developing over the next few years.” <i>Manager G2</i>
	Strategic decision-making while incorporating perspectives of key parties involved	“You know, when we have for example the Google collaboration internationally, we get that kind of guarantee, we get the platinum partnership where they provide us and they gave us guarantees such as if we suggest this, this will work. Or we get like you know decks from them, we got presentations with them, we get get-togethers. They can assure us that they are the right player to suggest in this kind of case. And you can make a meet-up to discuss different use cases. We can put together material. We can put together workshops with them as well.” <i>Manager S1</i>
	Organisational aligning (internal and external)	“And so from my perspective, first, it’s important to set the right expectations. That means often the management requests something which is not solvable with mathematics and algorithms.” <i>Associate Partner G1</i>
Managing Digital Value Capturing	Operational agility by using agile project methods	“Our resource allocation has changed a lot over time. In the last week, it has been 80% of clients, and about four, six weeks ago, it was 80% internal. And I think you can do a pretty straight linear interpolation between those two points. I think, right now, this is about as client-focused as it’s going to get. And back about six weeks ago, it’s about as internally focused as I’m allowed to be.” <i>Senior Consultant D1</i>
	Efficient process management and coordination through experience-sharing	“It may be a little surprising considering that the amount of leadership involvement and strategic work around it is very, very low. And this is very much a Bottom-Up movement. A lot of people are finding it useful. Half of companies and organizations are, everybody is self-taught, but also a significant portion of sharing tips and tricks. Formal training and guidelines are very, very rare.” <i>Senior Consultant D1</i>
	Strategic agility through organisational structures incorporating autonomy	“Of course, you have the concept phase, but usually, you work in an agile way. So if something comes up, right, you change it. Like yeah, when you proceed with a project. So during a project, conceptualization and implementation basically go hand in hand.” <i>Senior Consultant G1</i>

Digital Seizing			
Second-order themes	First-order categories	Exemplary Quotes	
Reinforcing Digital Value Capturing	Generating building blocks for business model innovation	“Consultancies that fully integrate AI into their activities will reap the most benefits, not least because clients that are already using digital data analytics internally will rightly expect it. Clients want to pay for the experience and insights of subject-matter experts and senior partners, not manual research processes that could be more efficiently performed by algorithms.” <i>Whitepaper A1</i>	
	Capitalizing and scaling of projects	“There are cases, like where you have a client that faces a certain problem and we rely on our library of solutions we have already developed. Of course we have to slightly adapt but then it is kind of ready to implement.” <i>Manager A1</i>	
	Manifesting thought-leadership and brand reputation through communication	“We took the gained insights from this small-scale case to develop our acoustic anomaly analysis tool [name] that will soon help engineers at the test benches at [client] to detect unintended noises such as squeaking in our electric car side mirrors and thus will support the vehicle development.” <i>Whitepaper G1</i>	

Assisting Digital Value Capturing

For optimal value capturing, the companies demonstrate the ability to use existing resources in a bundled manner for value creation. This is in line with the, by Holcomb et al. (2009) recommended, approach to use resource bundling to achieve better company performance, organizational alignment across departments, and strategic decision-making while incorporating the perspectives of key parties involved, whether on the client side or within the company itself. These capabilities include specifically the integrating of external resources from networks and partnerships for previously sensed business opportunities.

“We are a strategy consultancy, we do not have these digital assets upfront, they’re not flying around here in our backyard, and we bring them to a client. In our case, it’s more like, we have a problem and then we think about: ‘Hey, what type of tool can be built to address this problem?’ And then at some point we work with our [parent company]. [...] So, we approach [parent company] in the following manner: ‘You need to help us quickly. Code something, be it even based on Excel, really quick but also nice and neat.’ And then you start looking for expertise in the firm.” *Manager G2*

That very organizational and ecosystem readiness to capture strategic opportunities and the simultaneous outsourcing of non-strategic capabilities is, according to Feiler and Teece (2014), a Seizing Capability that supports organizational value capturing. The digital microfoundation described here also allows for the effective use of internal resources and valuable time-saving actions, an essential aspect of Seizing Capabilities (Teece, 2018).

Managing Digital Value Capturing

Digital Value Capturing, in the case companies studied, are predominantly DT projects for the client. Examples represent the introduction of cloud platforms at S1, the introduction of data analytics tools at G1, or the integration of AI tools at D1. It became particularly evident that the preservation and use of agility, be it at the organizational level or the project management level, is of central importance. The investigated companies use organization-wide agile project methods to achieve operational agility and have an organizational structure incorporating autonomy between units to demonstrate strategic agility. The

former ensures value capturing of digital projects on the operational level (Agarwal & Selen, 2009), whereas the latter on the strategic organizational level (Teece, 2016). Moreover, the embedded capability allows high learning effects and fast knowledge building despite and also because of the disruptive market circumstances (Teece, 2016), which can be exploited afterward by the whole organization.

“It may be a little surprising considering that the amount of leadership involvement and strategic work around it is very, very low. And this is very much a bottom-up movement. [...] Half of companies and organizations are, everybody is self-taught, but also a significant portion of sharing tips and tricks. Formal [...] guidelines are very, very rare.” *Senior Consultant D1*

This high level of autonomy and flexibility is used to build up know-how in diversified ways throughout the company and explore new opportunities using trial and error. Additionally, it allows for scaling them up in the case of favorable signs, characterizing Seizing Capability that permits promising business model transformation (Teece, 2010). The ability to respond quickly to changing market requirements and minimize errors during project execution also leads to more efficient process management and coordination. Notably, the experience sharing mentioned by the Consultant at D1 reduces delivery time and resource consumption during project implementation, and cost-effectiveness is a sign of successfully executed Seizing Capabilities, according to Vanpoucke et al. (2014). Another fundamental aspect to ensuring the successful management of Digital Value Capturing is necessary to engage the client during all phases of project execution actively. This approach enables the optimization of services facilitating the delivery of a value proposition that meets clients' expectations, even if they evolve throughout the project.

“We're putting efforts in towards to [...] go from an ideation phase into the specific client's business model, addressing topics like which customers to address, which markets, what are the digital component, which technology can help them in doing that and so on. And then [...] eventually even coming to a first proof-of-concept, or a prototype. Or if you would go further into implementation you would go to an MVP, and then a viable products. Or even a product and its releases.” *Manager G2*

Specifically, the agile way of working and the continuous flexible testing and adjusting of current value capturing processes correspond to Digital Seizing Capabilities that allow the basis for successful project execution (Warner & Wäger, 2019).

Reinforcing Digital Value Capturing

If the project is successfully executed, the companies examined demonstrate an ability to maximize the value created. The capitalizing and scaling of projects is only one aspect of this. This microfoundation also deals with Reinforcing Digital Value Capturing by generating building blocks for future business model innovation. Our data indicates that manifesting thought-leadership and brand reputation through

communication are also microfoundations. Companies that demonstrate such abilities use new technology projects to build their expertise and signal their success to potential clients.

“One key business development at [firm] over the last years is the fact that our project sizes are getting bigger, I think that is the main change. So in the beginning, most projects were two to three weeks, ‘we need you five days here’ or ‘10 days here’ after we’ve delivered now more than 50 success stories and our colleagues, and the clients know what we are capable of. We are also able now to tackle the bigger challenges, where people sometimes work half a year on a topic and so on.” *Associate Partner G1*

Sharing success stories of previous projects helps to expand one’s current digital business model portfolio to capitalize on opportunities. Precisely this communication usage to increase the reputation and trust with stakeholders to create additional value reflects fundamental aspects of Seizing activities (Feiler & Teece, 2014).

In the context of the companies studied, Seizing opportunities also means taking a forward-looking approach to maximize value creation. Such perspectives are also a fundamental component of the microfoundations of Digital Transforming Capabilities that can be seen in all case companies. Those DDC and their occurrences in our study are now presented.

Showcasing Digital Transforming Capabilities

Across organizations, strategic measures are in place to adapt the organizational digital culture and expertise, organizational processes, and organizational relationships to the changing market conditions and to optimize them accordingly. Those measures correspond to actions characterized by the continuous adaptation of a company’s own assets to maintain competitiveness in constantly changing markets, which are equivalent to Transforming Capabilities (Feiler & Teece, 2014; Teece, 2007). The data show that enhancing collaboration and communication for knowledge transfer combined with improving organizational agility and responsiveness are particularly important for promoting innovation. Digital Transforming consequently serves the companies to develop new client-oriented value offerings through the use of emerging technologies, expertise, and potential partners in the market.

“In today’s volatile and turbulent environment, companies are looking for more than just me-too solutions and business-as-usual processes to remain competitive. It’s not enough for consultancies to keep applying “tried and trusted” methodologies that push their clients into inflexible working models. As emerging technologies and the Digital Transformation open up new market space and opportunities, consultants need to reconfigure their approach and reject obsolete legacy models if they are to remain relevant to modern business.” *Whitepaper A1*

This development and refining of the current business model represent a management’s ability to deploy Transforming Capabilities (Teece, 2007, 2018). We infer that three microfoundations exist within the

Digital Capability to achieve such transformation into a digitally mature organization: Namely Digital Workforce Building, Digital Organization Building and Digital Ecosystem Building (**Table 7**), with all microfoundations working complementarily together.

Table 7*Digital Transforming Data Structure with Exemplary Quotes*

Digital Transforming			
Second-order themes	First-order categories	Exemplary Quotes	
Digital Workforce Building	Recruiting digital experts by increasing attractiveness of the own brand	“So we have those brains with that deep expertise and on the other hand, we are hiring more and more young people who were former interns and that are flexible and can learn from them. I mean, with this strategy, we have really broad competencies in teams and then they're quite flexible so it's not like they can only serve one method.” <i>Associate Partner G1</i> “You need to reform kind of model of consulting if you want to have in the future the right talents. Like, can you offer some kind of specialist track? Can we offer incentives like that so you can get promoted for providing the most awesome code instead of working eight hours plus and selling products for five million a year? You need to reform the kind of traditional management consulting view. Should you even have suits in the office anymore? Because Is that perhaps scaring away the right talents?” <i>Manager S1</i>	
	Developing digital expertise of internal and external stakeholder	“We have an internal data and analytics team that is growing and trying to upskill or expand its skills. So it used to be like when I started five years ago, Excel support, and creating macros. And now it's moving on to Alteryx, Power BI but they also are now able to do Python programming, that kind of thing.” <i>Manager G2</i>	
	Lead the organisation towards a digital identity		
Digital Organization Building	Adapt organizational structures to foster agile and collaborative work environment	“Our internal capabilities are mainly focused on really on modelling and generating insights out of data because it is internally on then everything that comes behind if you want to put on model an AI solution into operations if you want to connect it to client databases, if you want to apply it on a certain platform and so on. This is something where we use data engineers, infrastructure experts, and so on from our partners.” <i>Senior Consultant G1</i> “Regardless of how capable a consultancy's junior and mid-level consultants are, they won't possess the same level of industry knowledge and insight as senior partners. The one-size-fits-all approach of legacy consulting is a woefully inadequate model for any business striving to be genuinely innovative. The future of consulting should be predicated on greater senior partner engagement, because increasingly there are no “generic” projects. Clients can no longer afford to waste time and money on junior consultants data crunching and trying to come up to speed with their business. They want demonstrable value creation, not just analysis and strategy. Increasingly, senior experience and high-level expertise will be demanded to ensure the fast and successful execution of projects.” <i>Whitepaper A1</i>	
	Increase organisational technology maturity		
	Develop strong project-management-infrastructure built on cross-functional teams	“We at [Firm] kind of know it's an important topic, and we want to invest into data and analytics and it's one of our priorities, either in like industry strategies, but also like our technology strategy practice. And as I said, we wanted to this business-led and -driven so we're trying to get more and more projects.” <i>Manager G2</i>	
Digital Ecosystem Building	Build strategic relationships with clients and incumbents	“Establishing and nurturing complementary open consulting partnerships should be a key priority for the modern consultancy. For example, [Firm] is proud to have acquired two leading network-based organizations. Both organizations and their partner networks add invaluable knowledge and experience to [Firm]'s own expertise. In addition to its extensive in-house digital teams, [Firm] has also nurtured its own ecosystem of specialist data analytics and digital technology partners. Although [Firm] takes full responsibility for project deliverables, it doesn't hide the fact that it works with consulting partners. Clients like the fact that the best people for the job have been brought in, yet they don't have to deal with multiple stakeholders.” <i>A1 Whitepaper</i>	
	Build alliances with technology experts	“Our internal capabilities are mainly focused on really on modelling and generating insights out of data because it is internally on then everything that comes behind if you want to put on model an AI solution into operations if you want to connect it to client databases, if you want to apply it on a certain platform and so on. This is something where we use data engineers, infrastructure experts, and so on from our partners.” <i>Senior Consultant G1</i>	
	Nurture knowledge networks with academia and parent companies	“[Firm]'s Innovation and Research Department helps clients develop strategies to thrive in the face of discontinuity and disruption. A team of experts researches the novel and exponential technologies most likely to impact the future of business, and builds relationships with the start-ups, incumbents, and academic institutions creating them.” <i>Whitepaper S1</i>	

Digital Workforce Building

One specific statement of an expert on the subject matter highlights that the competitiveness of a company rises and falls with the quality of its workforce and their expertise, a conclusion which is also reflected in existing theory (Holcomb et al., 2009).

“And I think competence-wise, we are covering now, pretty much what we need, and we just have to get bigger and bigger to fulfill the rising demand in order to compete with the rest.” *Associate Partner G1*

Taking this specific point into account, our analysis revealed that continuously more emphasis is being placed on recruiting digital experts by increasing the attractiveness of the company's brand to optimize or even permit the transition toward a digital culture and identity. The aim here is to create a company built on a digitally affine workforce in time, develop it further, and utilize it, namely by expanding one's own portfolio of value offerings.

“I mean there is a lounge-like ‘Talk series’, so [firm] educates us for example in the IT practice about generative AI and sort of the basics so that we can initiate a client dialogue. And it will probably take a couple of weeks and then there's different kinds of training available. And I bet there are job postings already with AI specialists, because [...] there's a demand anticipated in the next couple of years.” *Manager G2*

This improvement of the company's internal competencies, also through a redesign of the organizational culture and processes, corresponds to the demonstration of Digital Transforming Capabilities (Warner & Wäger, 2019). This also shows that companies affected by DT are willing to invest resources in developing the digital expertise of internal stakeholders and place greater emphasis on building and fostering an interdisciplinary skillset to ensure shared, in-depth knowledge of digital topics across disciplines throughout the organization. Especially the ongoing elementary interaction between the workforces, which explicitly allows mutual learning and knowledge transfer, represents a Transforming Capability (Denford, 2013).

Digital Organization Building

Companies aim to maximize the potential value capture of both existing resources and future resources that will be added as a result of the Digital Transforming. Here, organizational measures are used to successfully integrate digital business models and thus also new digital value offerings throughout the organization. Such organizational capabilities reflect the ability to adapt organizational structures to foster an agile and collaborative work environment while developing a strong project management infrastructure built on cross-functional teams. Most notably, the building of organizational agility in Digital Seizing processes represents a Digital Transforming Capability that allows companies to successfully deliver value offerings to clients despite being faced by uncertainty (Teece, 2016). The combination of agility, flexibility,

and efficiency demonstrated by leveraging existing expertise leads to increased organizational technology maturity.

“We formed a team of methodical, organizational, and technical experts as our core AI team and implemented a holistic use case innovation funnel methodology that supports use case validation, incubation, and scaling. Based on this, we have built a product-driven organization (with business owners fully integrated in the process) that is able to develop AND implement products.” *Whitepaper G1*

Organizational agility thus also improves a company’s digital value creation, reflecting Teece’s (2016) view that Transforming Capabilities can enhance other DC. The organizations in this study are structured in such a way that knowledge sharing and internal communication, along with the spread of an agile work style, are critical components of the DT microfoundation presented here. These are the very elements that allow for the sustainable development of current and future key resources and capabilities. Indeed, this precise ability to continuously reorganize, confirms that the companies studied demonstrate DC (Feiler & Teece, 2014).

Digital Ecosystem Building

However, in order to not solely rely on internal resources for the DT of the business model, the sample of analyzed firms demonstrate the capability to acquire knowledge and skills externally and to integrate them effectively into the organization. Companies are focusing on building long-term strategic relationships with clients, incumbents, and technology experts with complementary resources and competencies. Thereby it is possible to optimize the current business model portfolio while also identifying further opportunities for services or offerings. Creating a digital ecosystem to invent and create collaborative new business offerings with partners implies successfully adopting Digital Transforming Capabilities (Warner & Wäger, 2019). Knowledge networks with academia and parent companies also represent important relationships. They address current and future client needs optimally through a cluster of assets, something considered no longer possible solely with internal resources and capabilities due to the increasing complexity resulting from the DT of the markets.

“For a genuinely client-focused organization, the overriding imperative should be to provide the best possible expertise for each individual project. Given that clients are increasingly looking to exploit emerging technologies and find new ways to create value, it’s unrealistic to expect that all of the relevant knowledge and experience will be housed within one consultancy, no matter how big it is. Establishing and nurturing complementary open consulting partnerships should be a key priority for the modern consultancy.” *Whitepaper A1*

The emphasized intention as a single company to increasingly rely on value-enhancing combinations based on the digital expertise of a cluster of partners reflects an essential skill that constitutes Transforming

Capabilities. Namely, to combine intra- and inter-organizational know-how and to optimize Sensing and Seizing Capabilities on that basis (Teece, 2007). In addition, because of their internal enablers in the form of financial assets, case companies can make strategic investments to proactively ensure that Digital Capabilities are available in the future to take advantage of digital opportunities that may not yet exist or have yet to be identified. Those measures can be the acquisition of companies with deep expertise in specific solutions (G2) or the establishment of technology centers of excellence (A1, G1, G2, S1).

This strategic approach simultaneously addresses two key aspects of Transforming Capabilities: Firstly, reallocating and recombining resources to optimize existing Sensing and Seizing Capabilities and create supportive internal institutions (Teece, 2007). Secondly, proactively creating new organizational structures (Matarazzo et al., 2021). Additionally, establishing digital hubs allows companies to optimize the Sensing of future possibilities and to generate new business model ideas while simultaneously develop the existing business further (Teece, 2017). Based on this, the data accumulated from the study show that companies relying on Digital Transforming Capabilities have a long-term perspective to maintain their competitiveness also in the future.

Our findings highlight in particular that various actors in the business ecosystem of the respective companies play a significant role in Digital Value Capturing, whether it is the workforce, customers, strategic partners or even competitors. This corresponds to existing knowledge regarding DC, which considers the complementary asset providers of a company, both inside and outside said organization, as an essential part of the value capturing procedure (Helfat & Raubitschek, 2018; Teece, 2017). However, the data also indicate consulting-specific aspects of DDC, which will now be discussed.

5.2 Consulting-specific Aspects of Digital Dynamic Capabilities

One of the fundamental goals of DC is to provide the ability to respond to changes in the business landscape in which the particular organization finds itself and to take proactive steps to benefit from those changes (Teece et al., 1997). Combining this aspect with the fact that the consulting sector is a service industry (Sarvary, 1999) with ever-changing clients (Glückler & Armbrüster, 2003) and correspondingly ever-changing solution portfolios, it is noticeable that our identified DDC address these aspects.

Consulting-specific Digital Sensing Capabilities

Since it is difficult to predict which clients one will advise in the future (Glückler & Armbrüster, 2003), the screening of new value creation opportunities itself is challenging, especially for the integration of new digital tools given the vast range of potential projects.

“We don’t sell tools. We’re in the business of helping and that comes in so many different shapes and forms each customer has a different industry, different company size, different market, and different problems.” *Senior Consultant D1*

Furthermore, this implies that the evaluation of strategic options has to be tailored to each customer on a case-by-case basis, given the high degree of individuality of each value proposition (Sarvary, 1999), which

means that the evaluation criteria of potential value opportunities vary from client to client and therefore often have to be developed from the ground up.

Consulting-specific Digital Seizing Capabilities

Besides constantly varying, consultancies' value offering is collaborative-based and requires the client's buy-in before being created (Glückler & Armbrüster, 2003). As a result, Seizing incorporates co-creation capabilities and using client processes as experimentation for exploring and developing new possibilities (Glückler & Armbrüster, 2003).

“But for us, as a strategy consulting, we like to talk about these things, and we love to come up with new innovations. I mean in the example of AI Tools, for instance, we talk specifically about use cases of AI. What type of AI-use cases can the client build from scratch? And how can they monetize it? What's the business case behind it? That's typically pure strategy consulting work.” *Manager G2*

Consulting-specific Digital Transforming Capabilities

Similarly, the Transforming Capabilities of the studied firms have been adapted to the industry's business model, namely to the fact that in consultancies, knowledge itself is a core product (Sarvary, 1999). Our empirical data show that consultancies have extended their Digital Transforming Capabilities to the extent that project insights are gained collaboratively at the client's site while being integrated into the most value maximizing way.

“Being able to offer an ‘outside view’ of a problem is one of the original reasons companies began working with consultancies in the first place – as the challenges clients face grow in complexity and the choices before them become myriad, having an organization at hand to help make sense of the world will be more important than ever. The value that consultancies offer clients, particularly those looking to gain competitive advantage via innovation, will increasingly be based on the size and diversity of their global networks, and the power of the knowledge they contain.”

Whitepaper A1

In the context of our study, Digital Transforming involves, therefore, creating knowledge networks that further optimize Digital Sensing and Digital Seizing Capabilities. As a result, current and upcoming projects with new customers can benefit from this Digital Capability. At the same time, the impact is cross-transferred between businesses and customers so that insights external to the consultancies can be integrated internally.

“I don't see a big difference in the way we will use AI tools as Consultants compared to the way our customers will use it. Given that at the end of the day, we're looking for the same two things. We're looking at improving productivity in our workflows,

[...], the quality of output and potentially finding new sources of revenue with new operating models.” *Senior Consultant D1*

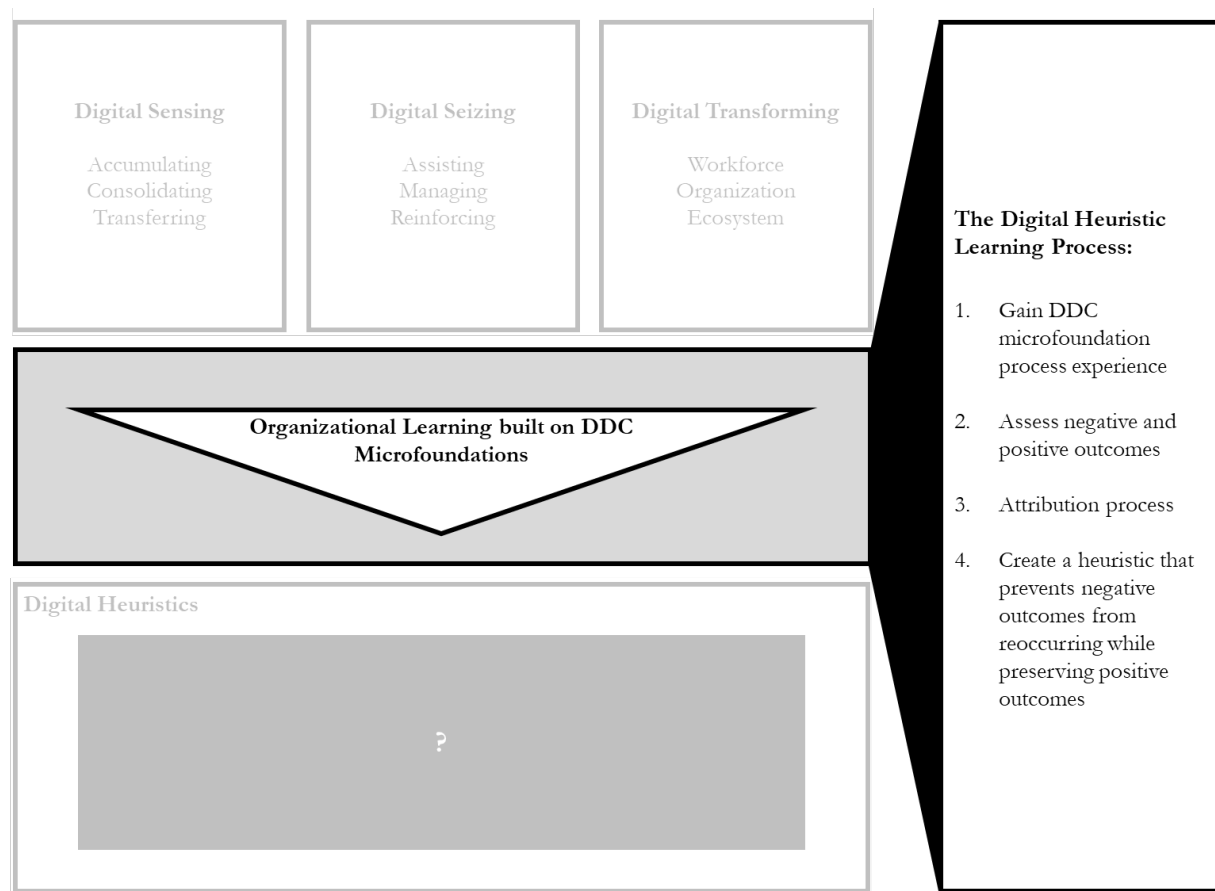
Although the specific characteristics of the companies’ DDC presented in the study show that certain aspects have been added for industry-related reasons, they also illustrate that the fundamental aspects of Sensing, Seizing, and Transforming have been retained.

5.3 Emergent findings regarding Digital Heuristics

Having presented our findings on DDC, we now showcase the analysis results regarding Digital Heuristics. This study provides empirically grounded data on the parallel existence of both concepts. To our surprise, DDC and Digital Heuristics did not only co-exist, but an interdependent connection was discovered. This adds to previous theorizing in its presumption that both concepts are complementary and build on each other (Peteraf et al., 2013; Schilke et al., 2018). While the DC framework already emphasizes the importance of learning and continuous improvement (Teece, 2007), part of what is learned from DC processes is explicitly formulated in Heuristics. Our emergent findings regarding DDC (Chapter 5.2) lay the foundation for our results on how Digital Heuristics are developed while adapting to DT. This outcome occurs through learning from the process experience of Digital Sensing, Digital Seizing, and Digital Transforming microfoundations. Once we have gained a comprehensive understanding of the Digital Heuristics learning process, we proceed to define Digital Heuristics.

The Digital Heuristic Learning Process

Figure 3 visualizes the interconnected relationship between DDC microfoundations and Digital Heuristics we propose. Note that Simple Rules and Heuristics focus on strategic processes and are learned from process experience (Bingham & Eisenhardt, 2011, 2014; Bingham, Eisenhardt, & Davis, 2007). Based on our interviews and archival data, the Heuristic learning process by Bingham and Halebian (2012) is expanded. First, companies deploy DDC microfoundations in their pursuit of renewing their resource base by adopting AI and Data Analytics. Then, based on this process experience, negative and positive outcomes are assessed. While, according to Bingham and Halebian (2012), only negative outcomes are considered when learning Heuristics, our data suggest that learned Heuristics aim to prevent negative outcomes while preserving positive outcomes of DDC processes. This aligns with research on human learning, which describes the learning of associations between actions and subsequent events. Operant conditioning learning processes, for example, are characterized by positive and negative outcomes (Skinner, 1938, 1953, 1957, 1969). Next, organizations form internal and external attributions of those outcomes, whereby convergent attribution facilitates the development of Heuristics (Bingham & Halebian, 2012). Finally, firm-level Heuristics are created to prevent negative outcomes and assure positive outcomes from reoccurring.

Figure 3*The Digital Heuristic Learning Process*

One example of a company developing a Heuristic from DDC process experiences is G1. Based on their experience from the DDC microfoundation of proof-of-concept, they developed a *value chain focus* Heuristic. The beginning of the learning process is the execution of a proof-of-concept during a client project.

“To accelerate production ramp-up, the manufacturer launched multiple showcases scattered along the production process, aiming to leverage the power of Data Analytics and AI.” *Whitepaper G1*

While a proof-of-concept is there to test a technology on a small scale before it is scaled up, it is also leveraged to show the value of technology. Thereby stakeholder or executive leadership buy-in can be achieved. Based on such success stories, more proofs-of-concept are inceptioned, and the organization gains momentum for additional implementations.

“As tangible results early on are important for management buy-in to further drive the Digital Transformation and roadmap execution, the selection of the right showcases is crucial.” *Whitepaper G1*

By deploying the DDC microfoundation of proof-of-concept, G1 identified these positive outcomes of this capability. These contrast with negative outcomes learned from the same microfoundation. Particularly, such initiatives tend to remain stuck in the proof-of-concept phase, whereby the technology's usage remains only in a specific application, processes within the firm are not adapted to the needs of the technology, and learnings from one proof-of-concept might not be applied to further projects.

“Six months into showcase implementation, 90 percent of them still were not able to show their dedicated impact on the overall production output increase or even detect which element plays which role on the critical path for ramp-up.” *Whitepaper G1*

“Many companies are stuck in the proof-of-concept or pilot phase of use cases when they try to implement them within their traditional structures.” *Whitepaper G1*

Consequently, firms aim to preserve the identified positive outcomes of the DDC microfoundation while preventing the negative outcomes from reoccurring. G1 developed a *value chain focus* Heuristic for selecting proof-of-concept cases. Thereby, more than the specifics of one process or organizational unit are recognized when a proof-of-concept is initiated. Instead, it is tied to required interfaces within the organization.

“When defining what is required, a scope covering the complete value chain related to the business problem is recommended. A value chain focus exposes interdependencies between different working steps, machines, parts or part categories, materials, processes, performance indicators, or even environmental parameters.”
Whitepaper G1

S1 is another example of a company that has developed Heuristics from its experience with DDC processes. Our data identified efficient process management and coordination through structure as a DDC microfoundation. Accordingly, S1's learning process began with gaining experience by building on existing structures, such as enterprise resource planning (ERP) systems.

“I think, so from my perspective, the approach that worked in the past, so you have a monolith, basically, SAP for example.” *Manager S1*

The positive outcome of such a microfoundation is a certain amount of efficiency in the pursuit of exploring new technologies. S1 learned that relying on existing structures lowers required investments when adopting new technologies. Especially through adhering to internal and external compliance and achieving economies of scale.

“So, I mean, if a client tries to phase out SAP. This is a very huge project and very expensive of course.” *Manager S1*

Conversely, S1 also identified negative outcomes from executing this DDC microfoundation. Namely, reduced flexibility as the costs of an overhaul are too high. Additionally, relying on one ERP system limits

the availability and integrability of novel technologies. Based on those learnings, S1 developed a *use a modular technology platform* Heuristic.

“But just find an architecture, right, where you can replace certain pieces if required. And you can make sure that basically, all the pieces work together, so if you exchange one piece, right, your system doesn't break down, but it's still working.” *Manager S1*

This Heuristic ensures that one central platform can deliver on most needs, saving valuable resources, while add-ons remain possible. **Table 8** summarizes this study's evidence on Digital Heuristics learned from DDC process experience. After establishing the Digital Heuristic learning process and highlighting its connection to DDC, we now turn to the definition and detailing of the concept.

Table 8

Illustrative Examples of learned Digital Heuristics

Companies	Digital Dynamic Capability	Identified negative outcomes	Identified positive outcomes	Learned Heuristics	Heuristic Type	Quote
• G1 • G2 • S1 • A1	Prototyping/ Proof-of-concept	• Stuck in the proof-of-concept or pilot phase • Technology usage remains limited to specific applications • Limited change of current processes • Limited learning, resulting in poor takeaways for other projects	• Ability to show value of technology • Achieve stakeholder/ executive leadership buy-in • Gaining momentum for additional implementations • Adequate use of resources	Take a holistic, the entire company encompasses perspective when initiating prototypes.	Procedural	"So, kind of like when trying to scale you need to make sure that in all the future necessary parts of the company you have the adequate data and the adequate quality and that you then actually can scale it." <i>Manager S1</i> "Disconnected showcases then typically dig deep into the analysis of massive amounts of data stored in separate silos rather than to optimize an end-to-end process chain or value stream." <i>Whitepaper G1</i> "The holistic approach to AI, by fostering scale, shared insights and shared leading practices, also makes it easier to predict the ROI of new initiatives." <i>G2 Whitepaper</i>
• G1 • G2 • S1 • A1	Building on existing technology infrastructure	• Reduced flexibility as cost of overhaul is too costly • Limited availability and integrability of novel technologies • Hindered organizational change	• Lower investments required • Assure internal and external compliance, saving resources • Economies of scale	Use a modular technology platform.	Select	"Find an architecture [...] where you can replace certain pieces if required. And you can make sure that basically, all the pieces work together, so if you exchange one piece, right, your system doesn't break down, but it's still working." <i>Manager S1</i> "So my recommendation would always be to avoid that if possible. And get a tool stack of like, let's say be more tool agnostic because tools, they come and go, but just find an architecture right where you can replace certain pieces if required." <i>Consultant G1</i> "The gold standard is to have one data catalogue – and one technology stack – for the enterprise and all business units – and giving business units the leeway to develop their own instance within the catalogue." <i>Whitepaper G2</i>
• G1 • G2 • S1 • D1	Building alliances with service providers	• Uncertainty about the reliability of the service provider • Dependencies on third-party providers • Vendor lock-in	• Gain access and expertise from external technology experts • Higher chances of success • Lower investments requirements	Rely on major/ large service providers.	Select	"So yeah, what I learned, kind of taught me was not to put too much effort into those actors. I took a lot of certificates back then in my spare time to learn many of the cool products and some of them haven't been mentioned in four or five years." <i>Manager S1</i> "I've seen small players succeeding. But yeah, I would say go with the big players and they're less risky for you." <i>Manager S1</i> "So it makes more sense to go with the bigger offerings, the bigger technologies rather than sort of relying on the smaller ones" <i>Manager G2</i>
• G1 • G2 • S1 • A1	Experiments (rapid tests/ autonomy)	• Scattered and disconnected initiatives • Difficult to control costs • Ambiguity of assessing success • Following fypes and experiments for the sake of a technology's novelty	• Gaining understanding of the technology • Sparks new, unintended and innovative solutions • Bottom-up employee involvement, lowering organizational barriers	"Business-First", focus on the business value when selecting use cases	Priority	"Therefore, it is important to start with a desired result: what business impact should be achieved?" <i>Whitepaper G1</i> "What is your most expensive decision?" should be the first question. It sets the business decision focus as a clear goal, moving it away from the typical use case thought "We know there is data available, let's use it to see what analytics can do with it." <i>Whitepaper G1</i> "To create value, you first need to be sure of your aspiration." <i>Manager G2</i> "But, first and foremost, start with value before data." <i>Whitepaper G2</i>
D1	Experiments (rapid tests/ autonomy)	• Integrity risk, such as poor results or leaked data • Lack of control • Uncertainties due to varying digital maturity within workforce	• Gaining understanding of the technology • Sparks new, unintended and innovative solutions • Bottom-up employee involvement, lowering organizational barriers	Do not upload client data and personal information to ChatGPT. Always review ChatGPT outputs.	Procedural	"I think in [firm], we have very few rules. So this should also not be a long set of rules. So we came up with two kinds of guidelines for people to follow. So it's not a manifest of do's and don'ts. It's more of a 'please be aware of these two things when you're using tools' such as chatGPT. [...] We saw some kind of pitfalls. We saw some benefits from going unstructured about using chatGPT." <i>Consultant D1</i> "So there are two rules: on the input side no client information and no personal information. On the output side: always review." <i>Consultant D1</i>

Companies	Digital Dynamic Capability	Identified negative outcomes	Identified positive outcomes	Learned Heuristics	Heuristic Type	Quote
• G1 • G2 • S1	Scaling Technologies and Projects	- Disagreement over resources responsibilities - Low usage in daily management routines - Lack of required data when implementing in new parts of the organization - Disregarded technology when anticipated results do not quickly materialize	Wider availability of technology within organization	Make AI a process topic.	Procedural	"AI can deliver more value at scale when it's embedded in application systems that work nonstop, analyzing and acting on data from inside and outside the organization." <i>Whitepaper G2</i> "In other words, data analytics and AI need to be integrated into daily operational management routines to be anchored in the organization." <i>Whitepaper G1</i> "This magnifies the challenge of embracing intelligent automation but can be overcome by making process excellence a part of every intelligent automation programme." <i>Whitepaper S1</i>
• G1 • G2 • S1 • A1	Accumulating Digital Information	- Unsubstantiated expectations, especially on C-Level - Disillusioned stakeholders, resulting in stagnating technology adoption	- Understanding market, industry and client - Urge to test new things	Set realistic expectations	Procedural	"Set realistic expectations instead of chasing science fiction." <i>Whitepaper G1</i> "This is usually something that comes in the beginning, so to better understand what's there and also what's possible, right? I mean, sometimes clients wish for X but they can only get Y because X is just not possible." <i>Manager S1</i> "We've seen many cases where clients were excited about the prospect of creating entirely new businesses and new sources of revenue in what seems to be the lucrative and accessible new area of big data, analytics, AI and 'rich content'. In a few cases they were right, but more often, they weren't. The opportunity, which seemed large at the outset, turned out to be small and difficult after a costly, unfocused and inefficient implementation that left them fearing repeating the process." <i>Whitepaper G2</i>
• S1 • G2 • A1	Formulating digital business strategies	- Tendency for "technology-first" approaches, deprecating business value - Neglecting that multiple technology solutions are needed - Difficulty of communicating strategy, due to lack of common language across business functions	Defined aspirations about what company wants to achieve with digital technologies	Focus digital strategy on certain categories	Priority	"By thinking thematically across these five digital imperatives—experience, insights, platforms, connectivity, and integrity—organizations can communicate across functions in a way that puts strategy before technology and can lead to initiatives that deliver a more modular, flexible technology core that better delivers transformation and strategic value." <i>Whitepaper S1</i> "So, business, experience, and technology are always the three lenses you can approach the topic from." <i>Manager G2</i>
• G1 • G2 • S1 • D1 • A1	Managing Digital Value Capturing	- Some technologies do not allow for human insight - Therefore augmentation is not possible - No validation of algorithmic results - Integrity risks	Functions not achievable in any other way	Use crystal-box-algorithms or trustworthy/ responsible AI	Select	"Apply crystal box instead of black box algorithms. [...] Consider which decision-makers will use the model to achieve this outcome, where the model will fit within the decision-making process, how it will integrate with the cloud, and how you will monitor, scale, improve and eventually retire it." <i>Whitepaper G2</i> "Protect yourself. Make your AI responsible. [...] When well implemented, responsible AI processes can assess your models for explainability, robustness, bias, fairness and transparency." <i>Whitepaper G2</i> "And then there's the part about transparency because if you're using it to create or to make a lot of decisions, that transparency and exactly why these models choose the way that they do might be lost in the process. So if this is an important part of the solution that you're trying to develop, then just have some considerations around the effectiveness of using generative AI." <i>Consultant D1</i>
• G1 • G2 • A1	Prototyping and scaling technologies	- Tendency to do everything at the same time - Stuck in the proof-of-concept or pilot phase - Technology usage remains limited to specific applications - Difficulties in determining when to switch the way of working	- Adequate use of resources - Wider availability of technology within organization	Focus, then scale after a corresponding trigger has been fired	Temporal	"Focus, then scale. [...] An effective way to use AI in highly complex decisions, such as ESG, is to start with a specific element, such as a single facility's carbon footprint. You can then scale up to other facilities and ESG factors." <i>Whitepaper G2</i> "Successfully implemented showcases are the trigger to scale the approach throughout the complete facility, across similar plants, and throughout the entire company." <i>Whitepaper G1</i> "Once value is seen in the pilot project, then investment should be made to productionize the approach." <i>Whitepaper A1</i>

Digital Heuristics

Hence, we argue that Digital Heuristics (DH) are the product of the repeated process experience of renewing resource bases by adopting AI and Data Analytics and, more generally, digital technologies. The Digital Sensing, Digital Seizing, and Digital Transforming microfoundations to adopt AI & Data Analytics, represent the basis for the process experience from which DH are learned. The DH identified in this study share key characteristics with organizational Heuristics and are used to inform DDC. Additionally, our data underpin the supportive role formal communication, besides informal communication, plays in creating Heuristics (Bingham & Halebian, 2012). Particularly, whitepapers could serve management consultancies to gather information from different parts of the organization, process it, and ultimately shape it into Heuristics.

While learning is already acknowledged as a central microfoundation of DC (Teece, 2007), these learnings are also explicitly formed and formulated into Heuristics.

“So, all those learnings over the first years where we of course did some pilots and also, we’re investing in such topics as in the first project [...]. We used the learnings to create those principles.” *Associate Partner G1*

“And then, I think [firm], we have very few rules. So, this should also not be a long set of rules. We came up with two kinds of guidelines for people to follow. It’s not a manifest of do’s and don’ts. It’s more of a ‘please be aware of these two things when you’re using tools’ such as ChatGPT.” *Senior Consultant D1*

As the learnings we observe share key characteristics with the descriptions of Heuristics (Bingham & Eisenhardt, 2011, 2014) and DC (Eisenhardt & Martin, 2000), we argue that these are organizational Heuristics from and for adopting AI and Data Analytics technologies. Both illustrations of how G1 and S1 developed Heuristics from DDC microfoundations’ process experience exemplify the semi-structure characteristic of Heuristics (Bingham & Eisenhardt, 2014; Bingham, Eisenhardt, & Furr, 2007; Davis et al., 2009). For example, G1’s *value chain focus* Heuristic leaves room for flexibility in running independent proofs-of-concept while assuring those are tied to required interfaces within the organization. Similarly, S1’s *use a modular technology platform* Heuristic allows for flexible technology adoption while assuring structure through relying on one central technology platform. This optimal structure of dealing with uncertainty represents a core characteristic of DC (Davis et al., 2009; Eisenhardt et al., 2010).

“Our digital imperatives can enable organizations to drive transformations that align to their overarching ambition while remaining open to future strategy changes.”

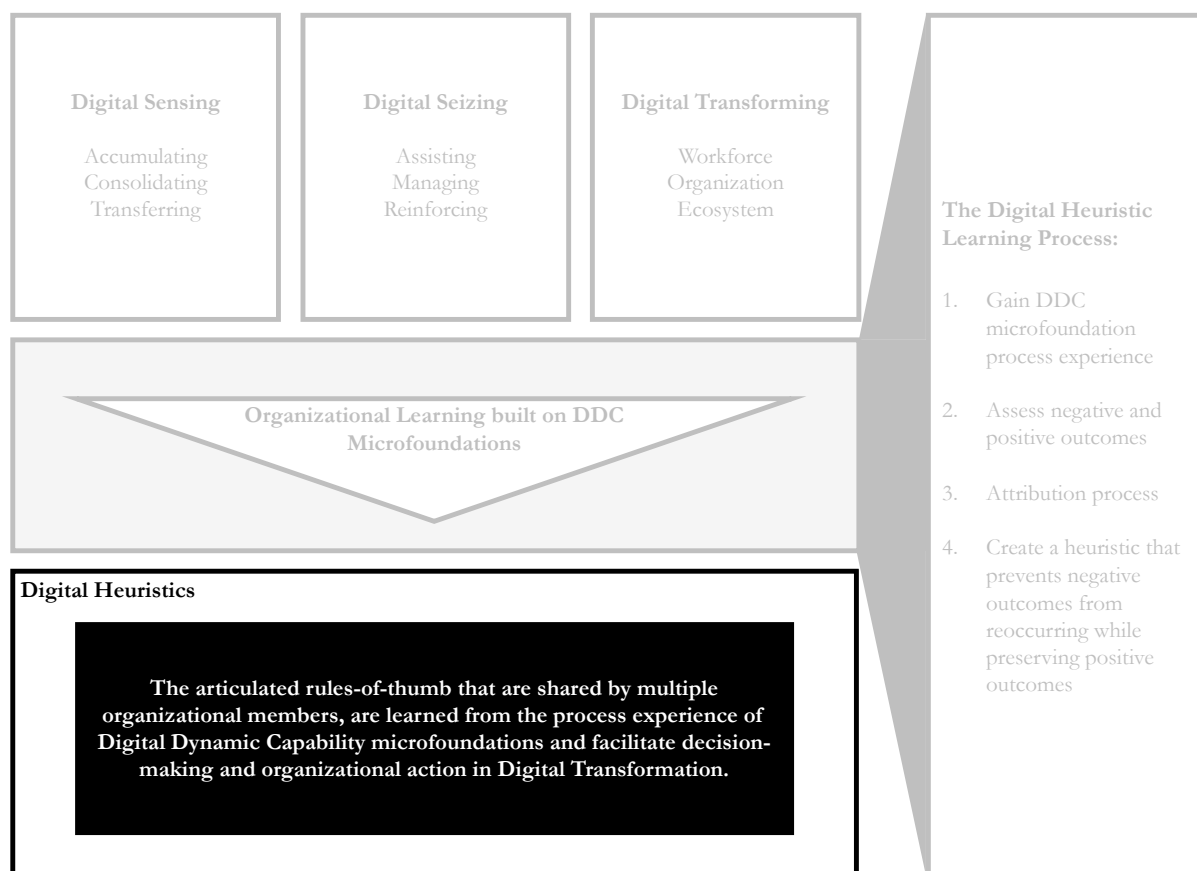
Whitepaper S1

The Heuristics identified by our study are shared between several organizational members, a key characteristic of organizational Heuristics (Bingham & Eisenhardt, 2011).

Therefore, we are able to offer a DH definition. Based on our data and work by Bingham, Eisenhardt, and Furr (2007), we define *Digital Heuristics* as the articulated rules-of-thumb that are shared by multiple organizational members, are learned from the process experience of Digital Dynamic Capability microfoundations and facilitate decision-making and organizational action in Digital Transformation. By establishing this definition, we solidify the concept of DH and complete our General Model (**Figure 4**). As a result, the parallel existence of the TPS and EM conceptualizations becomes apparent, and the newly developed connection between the two camps is revealed.

Figure 4

Digital Heuristics



Investigating management consultancies allowed us to observe formal written communication's facilitating role in forming Heuristics. Bingham and Haleblan (2012) note how formal communication, such as weekly meetings, helps organizations to form coherent attributions of negative outcomes connected to the organization. While we interviewed organizational members from multiple hierarchical levels (i.e., Consultants, Managers, and Partners), we did not uncover meaningful information on the attribution behaviors of these organizational members. However, many Heuristics within our study surfaced from whitepaper archival data. Those whitepapers are usually written by multi-hierarchical teams, including Junior Consultants, Managers, and Partners. Therefore, our data suggest additional proof for formal procedures that allow multiple individuals to generate shared understandings and judgments jointly (Bingham & Haleblan, 2012).

“Based on in-depth, first-hand experience and primary research across multiple industries, this report provides practical, realistic insight into how this impact can be achieved.” *Whitepaper A1*

After gaining DDC process experience and developing DH based on this experience, the Heuristics are used to inform DDC itself.

“Five imperatives to drive Digital Transformation.” *Whitepaper S1*

When classifying DH into selecting, procedural, priority, and temporal Heuristics, the way Heuristics inform DDC microfoundations can be detailed. Developed DH preselect opportunities to sense, seize, and transform. The aforementioned *use a modular technology platform* Heuristic guides which market opportunities to pursue and therefore represents a selection Heuristic (Bingham & Eisenhardt, 2011). Thereby, this Heuristic preselects opportunities to find (sense) and exchange (seize).

“Find an architecture [...] where you can replace certain pieces if required. And you can make sure that basically, all the pieces work together, so if you exchange one piece, right, your system doesn’t break down, but it’s still working.” *Manager S1*

D1 developed a *don’t share client/ personal data with ChatGPT* Heuristic, which guides the execution of a selected opportunity, making it a procedural Heuristic (Bingham & Eisenhardt, 2011). Interestingly, this Heuristic was developed from Sensing experience.

“We saw some kind of pitfalls. We saw some benefits from going unstructured about using ChatGPT.” *Senior Consultant D1*

“We have to keep up, we kind of have to start exploring these things on our own while you know, being aware of all the risks so we're not doing anything stupid. That’s why we're doing the internal training to make sure okay: ‘Don’t share any personal data or client information with it’. But there's no issue for us concerning kind of exploring on a personal basis, kind of seeing how we can feed in tasks that would help us increase productivity or also improve quality.” *Senior Consultant D1*

Besides informing the Digital Seizing microfoundation processes of experiments, D1 also leveraged the Heuristic in their employee training efforts, a clear Transforming Capability. Hence, all types of DH (i.e. selection, procedural, priority, temporal) can inform Digital Sensing, Digital Seizing, and Digital Transforming Capabilities. Additionally, DH learned from one DDC (e.g. Digital Sensing) can inform processes within another DDC (e.g. Digital Seizing). Our study also identified priority Heuristics, such as G1’s *business-first* Heuristic, which ranks the opportunities by their impact on business value (Bingham & Eisenhardt, 2011).

“What is your most expensive decision?” should be the first question. It sets the business decision focus as a clear goal.” *Whitepaper G1*

Our data also suggest validation for the development forms postulated by Bingham and Eisenhardt (2011). In the case of G1, organizational members during interviews and newer whitepapers referred to the *business-first* Heuristic, while older whitepapers did not.

“Most companies are therefore better served by beginning with promising use cases, rather than waiting to identify the one case with the highest business value.”

Whitepaper G1

This suggests that Heuristics become more strategic over time and that higher-order Heuristics, such as priority Heuristics, are learned later (Bingham & Eisenhardt, 2011). Finally, our data also identified temporal Heuristics. G2's *focus, then scale* Heuristic paces Sensing, Seizing and, Transforming processes, making it a temporal Heuristic (Bingham & Eisenhardt, 2011).

“Focus, then scale. [...] An effective way to use AI in highly complex decisions, such as ESG, is to start with a specific element, such as a single facility's carbon footprint. You can then scale up to other facilities and ESG factors.” *Whitepaper G2*

Digital Heuristic Propositions

Taken together, this study provides empirically grounded data on the parallel existence of DC and Heuristics. Both concepts are dependent on each other. We infer the following propositions:

Proposition 1: Organizations learn Digital Heuristics from Digital Dynamic Capabilities' Sensing, Seizing and Transforming microfoundation process experience.

Proposition 2: Digital Heuristics inform Digital Dynamic Capabilities by preselecting opportunities to sense, seize, and transform (Selection Heuristics), guiding actions of DDC processes (Procedural Heuristics), establishing focus areas within DDC processes (Priority Heuristics), and timing DDC processes (Temporal Heuristics).

Proposition 3: Digital Heuristics learned from one DDC category (e.g. Seizing) can inform processes within another DDC category (e.g. Sensing).

5.4 Consulting-specific Aspects of Digital Heuristics

While the literature on DC covers the realm of external capability development, such discussion is not covered within the organizational Heuristics literature. Heuristics are common in structure and differ in their specific content for each firm (Bingham & Eisenhardt, 2011). This anchors the development and use of Heuristics within organizations. However, in the study setting of consultancies, the co-creation of Heuristics as well as internal and external usage of Heuristics, becomes apparent.

“So all those learnings over the cover of the first years where we of course did some pilots and also, we're investing in such topics as in the first project, the client was not

paying for it, but us [paying for it]. We used the learnings to create those principles.”

Associate Partner G1

“But in general, those principles would mean the same for us, if we work on internal use cases because, in the end, it is about where do we generate the most impact at [firm].” *Associate Partner G1*

“In terms of the guidelines that we have internally, will they go across industries and clients? [...] So yes, in a sense to the fact that you can replicate these across industries because they are two rules and they're very basic.” *Senior Consultant D1*

Hence, in the case of consultancies, Heuristics seem to be conceptualized in a way that they work for internal as well as external purposes. Heuristics are used because they are easy to remember and communicate (Bingham & Eisenhardt, 2011, 2014). In the case of S1, articulated Heuristics were even referred to as a strategic language that helps organizations to communicate and coordinate across functional and organizational boundaries.

“By thinking thematically across these five digital imperatives—experience, insights, platforms, connectivity, and integrity— organizations can communicate across functions [...]” *Whitepaper S1*

Our data suggests that this easy-to-communicate characteristic of Heuristics could be one reason why DDC learnings are explicitly formulated into DH. In that way, DH represent viable communication vehicles that can be easily communicated within and, in the case of consultancies, even beyond the organization.

6. Discussion

We set out to discover how management consultancies utilize Heuristics and Dynamic Capabilities in their approach to cope with the uncertainty and opportunities marked by Digital Transformation. After we showcased our results, we now answer the research question (Chapter 6.1). Afterward, we present the Theoretical Contributions of this paper (Chapter 6.2). Then, we carve out Managerial Implications (Chapter 6.3). We conclude the paper by critically reflecting on limitations of our study, considering our specifically chosen methodology, and presenting implications for future research (Chapter 6.4).

6.1 Answering the Research Question

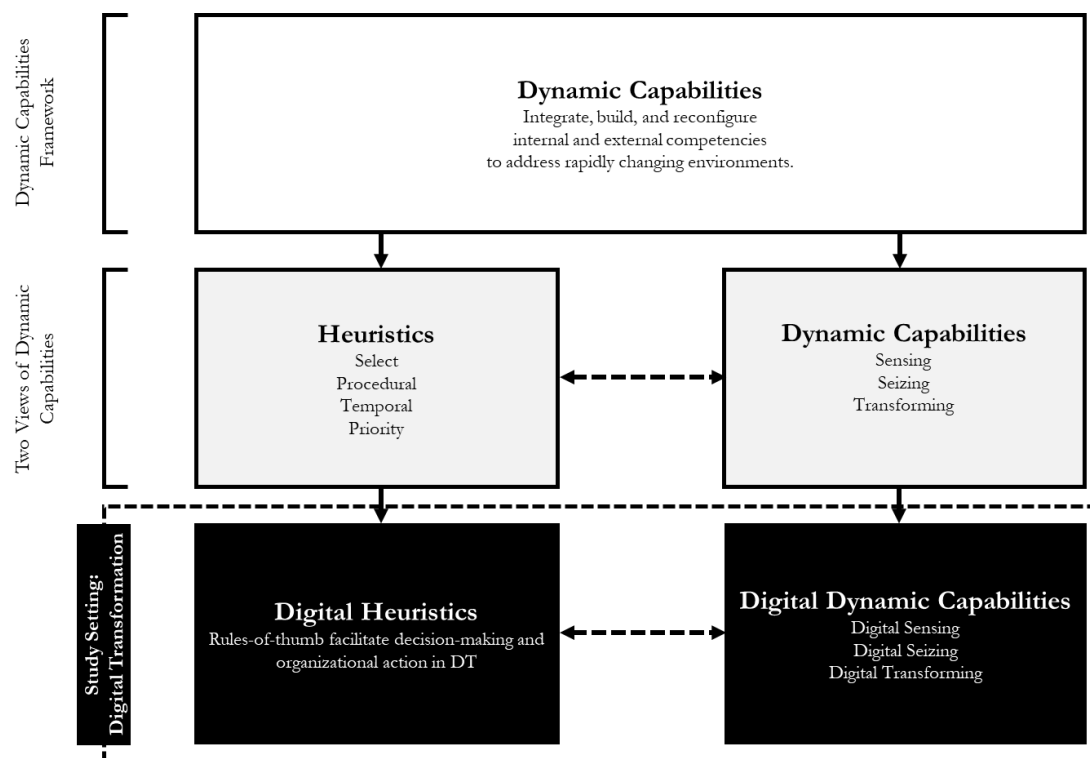
This study posed the following research question. In this section, we discuss the applicability of our results in answering this question.

How do Management Consultancies utilize Heuristics and Dynamic Capabilities in their approach to cope with the uncertainty and opportunities marked by Digital Transformation?

Management consultancies utilize both, Heuristics and Dynamic Capabilities to cope with the uncertainty and opportunities marked by Digital Transformation. A central notion of our study is the strong client focus of all capabilities utilized by consultancies. When management consultancies digitally sense, they specifically intend to understand the client better. As the timeliness and appropriateness of services on a case-by-case basis are crucial, sensed customer requirements can be seen as a specification for all subsequent Sensing activities. Technological, social, and regulatory trends are, for example, sensed on the background of customer utility. Comparably, Seizing activities primarily focus on customers, and collaborative activities are critical here. Client processes are considered learning cases where knowledge is collaboratively generated. This knowledge is, in turn, applied internally and externally. This deploying of Digital Transforming Capabilities shows once again that the capabilities of the consultancies impact not only their own company but also client companies. Considering the important role ecosystems play for DDC (Warner & Wäger, 2019), our data show what role consultancies play in these. That is, they do not only provide crucial expertise but also provide DDC to their ecosystem. Here, DH are utilized in a supportive manner. Our results highlight the internal and external applicability of DH. Furthermore, due to their easy-to-communicate characteristics, management consultancies utilize DH as communication vehicles in their pursuit to transform members of their ecosystem. Additionally, Heuristics' developing character and ability to generalize helps consultancies to make the shared expertise up to date and appropriate, two key consideration. Taken together, management consultancies utilize Heuristics and DC to first understand, help and transform customers, sharing crucial expertise. This, in turn, transforms the consultancy itself.

6.2 Theoretical Contribution

Based on our data, we discovered that organizations have DDC and DH. Additionally, we uncovered an interplay between these two capabilities, a finding that offers three enrichments at the theoretical level. Thus, referring back to our research framework, we can now describe the questioned areas (**Figure 5**):

Figure 5*Research Framework including New Findings*

Hereby we reinforced existing findings that support the existence of DDC and enriched the understanding of those capabilities by adding further empirically grounded insights. Also, we demonstrate the presence of Digital Sensing, Digital Seizing, and Digital Transforming at the organizational level while also detecting, concurrent to existing literature (Chirumalla, 2021; Ellström et al., 2022; Karimi & Walter, 2015; Warner & Wäger, 2019), the role of internal enablers and external disruptors that influence those DC (Karimi & Walter, 2015). By analyzing different companies, we produced and documented novel insights regarding DDC's internal processes. Namely, the understanding that respective microfoundations of DDC build on each other. For example, in the case of Digital Sensing, first, the accumulation of digital information, and its subsequent consolidation, followed by the transferring of that digital information. Additionally, the topicality of our findings is particularly important for future studies. Because DT is continuously creating exponentially disruptive changes in shorter periods (Henriette et al., 2015), one needs to continuously take renewed assessments of the capabilities found in organizations to have the best possible picture of what strategies companies have in place to deal with uncertainty (Hanelt et al., 2021; Warner & Wäger, 2019) as new skills are constantly being added.

The second aspect relates to our discovery of and subsequent support for DH. Existing theoretical concepts regarding DC and DDC already emphasize the importance of learning and continuous improvement (Chirumalla, 2021; Soluk et al., 2021; Teece, 2007; Warner & Wäger, 2019). But our empirical data indicate explicitly that knowledge gained during the execution of DDC processes is packaged in DH. DH are thus the product of repeated process experience of adopting digital technologies

via Digital Sensing, Digital Seizing, and Digital Transforming microfoundations and inform these DC themselves. Accordingly, it follows that both concepts are complementary and build on each other (Schilke, 2018; Peteraf, 2013; Cooper, 2010). Also we extend the theory by suggesting that DH can serve the coordination of both internal and external organizations (Vuori & Vuori, 2014) and are openly communicated and distributed for this purpose, partly as a value offering, a unique perspective on Heuristics.

Furthermore, the third contribution enriches the theoretical field of DC as the empirically grounded connection between Heuristics and the microfoundations of DC allows for a more granular comparison of TPS's and EM's DC conceptualizations. The circumstance that Heuristics are learned from the process experience of microfoundations suggests that there are levels of DC. Several scholars have already done the situating of DC on different levels (Ambrosini et al., 2009; Collis, 1994; Winter, 2003). And here lies the core of the divide within the DC framework: As Teece notes, the differences between both camps “now come down to the balance between routines and decision making” (Teece, 2023, p. 125), that is, the differentiation between Lower and Higher level Capabilities.

To understand comprehensively the levels of DC, it is crucial to identify the underlying factors upon which the hierarchy is constructed. We identify two distinct factors connected to TPS and EM in the literature: The strategic levels of processes and environmental levels. Regarding TPS, Teece (2023) and Winter (2003) evaluate the level of capabilities on the continuum between operational and strategic. According to these authors, ordinary or zero order capabilities covering administration and governance-related capabilities are the lowest. Conversely, High-level DC or higher order capabilities represent the most strategic processes (Teece, 2023; Winter, 2003). Differently, EM (2000) and Ambrosini et al. (2009) evaluate the level of capabilities on the continuum between stable and volatile environments. To these authors, capabilities are routines or Incremental DC in risky environments. In uncertain environments, they take the form of Simple Rules/ Heuristics or Regenerating DC (Ambrosini et al., 2009; Eisenhardt & Martin, 2000).

The divide stems from the fact that Eisenhardt and Teece, both from their respective point of view, ‘downgraded’ the other conceptualization of DC to a lower level. To TPS, EM's conceptualization of DC represent “narrow-purpose activities” (Teece, 2023, p. 122) they call microfoundations. To EM (2000), volatile and uncertain environments are boundary conditions for TPS's DC conceptualization and argue these DC might occur in more stable environments where they take a routine-like form. However, we argue that this mutual disavowal does not stem from an inherent contradiction of the two conceptualizations. Instead, the origin lies in the two different perspectives: Strategic level vs. environmental level.

Expanding on Ambrosini et al. (2009), we suggest that both perspectives are relevant. Ambrosini et al. infer that “when considering environmental dynamism, it is critical to do so in terms of, first, whether managers perceive that there are changes in their external environment, and second if they perceive their

firm needs to change” (2009, p. 13). Hence, managers might initiate change in response to shifts in their external environment or for internal reasons, such as wanting to create impact (Ambrosini et al., 2009). Therefore, both perspectives, strategic degree, and environmental condition, are valid, as DC might be performed in strategic and/ or uncertain circumstances.

Taking both perspectives simultaneously, thereby equating strategic with uncertain factors and risky with operational factors on the continuum, a comparison of all four versions of DC levels is possible. **Table 9** summarizes this comparison.

Table 9

Three Levels in the Dynamic Capabilities Framework

Factor		Authors			
		Strategic Levels		Environmental Levels	
Environment	Strategic Degree	Teece (2023)	Winter (2003)	Eisenhardt & Martin (2000)	Ambrosini et al. (2009)
Uncertain	Strategic	High-level Dynamic Capabilities (Sensing, seizing, transforming)	Higher order capabilities (Organizational learning for Dynamic Capabilities)	Simple Rules/Heuristics	Regenerating Dynamic Capabilities
		Low-level Dynamic Capabilities/ Microfoundations	First Order Capabilities/ Dynamic Capabilities	M&A, Internationalization, Product Development	Renewing Dynamic Capabilities
Risky	Operational	Ordinary Capabilities	Zero Order Capabilities	Routines	Incremental Dynamic Capabilities

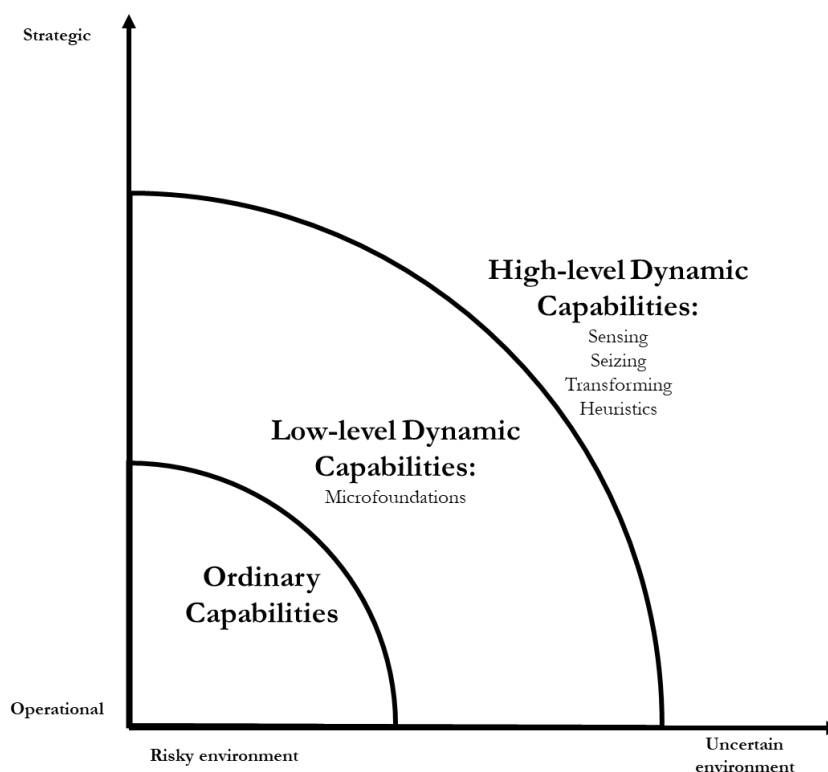
Note. The level assignment of the capabilities is made in each case from the perspective of the corresponding author.

This comparison offers striking commonalities. First, all four author groups acknowledge a lowest level of capabilities, which is relevant in either risky market environments or on an operational level. These are “administrative, operational, and governance-related” (Teece, 2023, p. 123) capabilities in the form of “complicated, detailed, analytic processes” (Eisenhardt & Martin, 2000, p. 1106) whose initiated change is limited to “incremental adjustments and improvements” (Ambrosini et al., 2009, p. 14) and ultimately determine “how we earn a living now” (Winter, 2003, p. 992). In summary, we are talking about the Ordinary Capabilities that *manage a firm’s resource base*. Second, all four author groups acknowledge a middle level of capabilities, which is relevant when a moderate degree of change is required, strategic or environmental. These are microfoundations, such as processes for “forming external partnerships”

(Teece, 2023, p. 123), “product development routines” (Eisenhardt & Martin, 2000, p. 1107) or changing “the customers (markets) served” (Winter, 2003, p. 992), that are concerned with “the capacity of an organization to purposefully create, extend, or modify its resource base” (Helfat et al., 2007, p. 1, as cited in Ambrosini et al., 2009). Here, we are talking about Low-level DC that *change a firm’s resource base*. Finally, all four author groups acknowledge a higher level of capabilities, which is relevant when fundamental change is required, either strategic or for environmental reasons. These processes “enable an enterprise to profitably build and renew resources and assets” (Teece, 2023, p. 123) which requires “the creation of new, situation-specific knowledge” (Eisenhardt & Martin, 2000, p. 1112) to “facilitate the creation and modification of” (Winter, 2003, p. 994) the Low-level DC as these are “perceived to be insufficient to impact appropriately upon a firm’s resource base” (Ambrosini et al., 2009, p. 15). In essence, we are talking about the High-level DC that *change a firm’s Low-level Dynamic Capabilities* itself. **Figure 6** visualizes the three levels of DC on the two dimensions of strategic degree and environmental condition, using the terminology of Teece (2023).

Figure 6

Three Levels in the Dynamic Capabilities Framework across two Factors



Our data support this joined structure of DC on three levels, as it reveals empirical data on all three levels and the subsequent interactions between them. First, we raise the importance of internal enablers, such as data governance, representing critical Ordinary Capabilities in managing the digital resource base. At the same time, we highlight DDC microfoundations as Low-level Capabilities through which management consultancies digitally transform their business model. Still, learning occurs during the process of Low-

level DC, from which Digital Heuristics as High-level DC are formed. Those Heuristics, in turn, inform Low-level DC.

By structuring different capability concepts on three levels and enriching this structure with empirical data, we offer required, theoretical integration of the two divergent camps of DC: Realizing that they are *Not So Different After All*.

6.3 Managerial Implications

Besides these theoretical contributions, we infer managerial ones. The study results provide management consultancies valuable insights for evaluating their current position in the face of the uncertain business landscape caused by digital disruption in various industries of their clients. The study revealed that DDC are strongly integrated into all case companies, indicating that the Digital Transforming of one's business model is already widely recognized as necessary for remaining competitive. However, consultancies that do not fully possess our identified DDC should question the reasons why they must still be leveraged. Agile work practices, flexible organizational structures, and trial-and-error approaches for offering digital expertise and solutions are already industry standards. As a result, the DDC and microfoundations identified in the study should be considered requirements for any consulting firm looking to be viewed a potential service provider by clients. Moreover, our study highlights the importance of effectively communicating expertise in new digital technologies and utilizing this knowledge to achieve maximum benefit. DH are a widely used tool for distributing technical knowledge and project insights in the consulting industry. This approach can lead to improved project efficiency and effectiveness while also helping to avoid potential pitfalls and safeguard both tangible and intangible assets by increasing digital expertise internally across the organization (Laforet, 2011; Silzer & Dowell, 2010). Sharing digital expertise externally via Q&A sessions, articles, or industry summits, can also help to attract new clients, including a digitally-savvy workforce (Hiltrop, 1999; Mihalcea, 2017). Furthermore, enhancing digital know-how can significantly increase organizational digital maturity and engage employees more meaningfully (Andriopoulos, 2001). Overall, The significance of DH and DDC will only increase over time. Consultancies have taken note of this necessity as they are forecasting substantial obstacles for the industry in the coming years, particularly in addressing uncertainty and difficulties that arise in diverse markets brought by DT.

“If we’re seeing everywhere a 40% increase in productivity because of AI, then that’s a kind of business problem for everyone. Right? It’s not a sector-specific or company-specific thing.” *Senior Consultant D1*

6.4 Limitations and Future Research

Finally, we critically reflect upon our study and identify implications for future research. First, referring to the five goals of our study summarized in Chapter 4.2, we determine that we fulfill these to the extent possible. The study (1) builds and elaborates on the DC framework by combining our empirically grounded data with existing theory. Our findings also (2) offer managerial implications. By (3) including

qualitative interviews and archival data, we pay attention to the contextual details of DC and DT. (4) We are confident of getting closer to the true manifestation of DC as we take multiple perspectives through the triangulation of cases and data. While we (5) establish a new theoretical construct with DH, we fail to make it measurable. A fact we will elaborate on when considering the quality of our study across three evaluation criteria of the Eisenhardt Method. **Table 10** offers an aggregated overview based on Eisenhardt (1989) and Eisenhardt et al. (2016).

Table 10

Determined Compliance Level across three Evaluation Criteria

Source	Evaluation Criteria		
	Methodology	Theory	Insights
Eisenhardt (1989)	- Careful analytical procedure - Evidence that supports the theory - Rival explanations ruled out - Description of conducting data - Validity through displaying enough evidence	Is parsimonious, testable, and logically coherent	Study offers new insights
Eisenhardt et al. (2016)	- Grounded in compelling data - Data revealed in a good way	Well-defined concepts, relationships between constructs, and underlying logical arguments that support these relationships	- Unexpected insights - Contribute to specific research conversation or open a new one
Determined compliance level	Adequat	Adequat	Fulfilled

Note. Categorization of evaluation criteria established by the authors according to Eisenhardt (1989) and Eisenhardt et al. (2016). Evaluation on three levels: Not fulfilled, adequate, fulfilled.

Specifically, we see limitations within the methodology of our study as the number of interviews lies below 20. While the targeted interview partners are difficult to access, we see improvement opportunities in three ways. First, the number of interviews per case company should be higher. As some cases include less than three interviews, we see the possibility that crucial aspects still need to be discovered, since the study deals with organizationally shared concepts. Additionally, inferring conclusions for a whole organization of the size of our case companies, based on a limited number of interviews, could represent an overly simplified generalization. Second, we see the untapped potential of follow-up interviews, as some aspects of Heuristics and DC only become evident over time. Learning processes are about changed behaviour over time after a stimulus is perceived (Pemberton & Stonehouse, 2000). Finally, our study represents cross-sectional snapshots. While the triangulated and archival data from different years relativize this limitation, we are convinced a longer study timeframe would have provided richer data.

Moreover, we identified certain constraints within the theoretical aspects of our study. Although we provide empirical and theoretical arguments for the three levels of DC and their corresponding relationships, our model remains challenging to measure and test. As Teece acknowledges, DC “is a framework rather than a disprovable theory” (Teece, 2023, p. 126). While the unification of the DC framework is progressing (Teece, 2023), a process to which our study contributes, advancing it to the degree where we can measure and observe previously unobservable constructs represents a desirable objective (Godfrey & Hill, 1995). As a final limitation, our analysis could also have focused more on cross-case aspects. Thus, results with a higher level of detail would have been generated, focusing explicitly on differences in utilized DDC between case companies.

Additionally, we see the following implications for future research. First, our findings originate from the study setting of the digital technology adoption of management consultancies. Therefore, future research should evaluate whether our generalization of the DC framework holds true in other contexts. Second, the recent link between microfoundations and Heuristics highlights the need for a deeper comprehension of the formation process of Heuristics. Future research could investigate additional mechanisms that facilitate the development of Heuristics besides the formal procedures Bingham and Halebian (2012) and our study offer. Third, it would be beneficial to understand whether Heuristics can be developed consciously and, if so, whether this process can be made more effective and efficient. This would enhance the practical relevance of the scientific knowledge on organizational Heuristics and DC in general.

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Appendix

Information Sheet for Interview Participants

Dear [Name]

as part of our degree in Business & Management, we are writing our master's thesis. Within the scope of the thesis, it is discussed which capabilities are involved in utilizing AI technologies in the process of acquiring, developing, and delivering consulting projects. For this purpose, we would like to conduct an interview with you. At the end of this introductory letter, you can find a consent form, adhering to the EU General Data Protection Regulation (GDPR), which we kindly ask you to fill out.

Your participation is, of course, voluntary. You can withdraw your participation before, during and after the interview, without giving a reason and without consequences. You have the freedom to withdraw statements after the interview was conducted. This is possible until 01.05.2023, after which no complete withdrawal is possible due to the further processing of your statements and submission of the master thesis.

The interview will be recorded and then transcribed. This transcript will be anonymized by assigning an individual code to each participant. Text passages containing person-specific information will also be removed or modified. After the recording has been transcribed, it is deleted. Thus, no conclusions can be drawn about your person and none of your statements can be traced back to you. The information you provide will be kept strictly confidential and there will be no disadvantages for you because of participating in the study. We reserve the right to quote your anonymized statements in the paper.

The thesis will be published by the Stockholm School of Economics, enabling public access. However, the whole transcribed interview will not be included in the published paper.

Thank you very much for your time and your willingness to contribute an important part to our master thesis. We appreciate you investing resources and time in our project and are confident that your participation in our study will enrich us with valuable information. Please feel free to email us with any queries or further concerns (42063@student.hhs.se).

Yours sincerely

Harrison Mohandas & Josch Walder

The student's project. As an integral part of the educational program at the Stockholm School of Economics, enrolled students complete an individual thesis. This work is sometimes based upon surveys and interviews connected to the subject. Participation is naturally entirely voluntary, and this text is intended to provide you with necessary information about that may concern your participation in the study or interview. You can at any time withdraw your consent and your data will thereafter be permanently erased.

Confidentiality. Anything you say or state in the survey or to the interviewers will be held strictly confidential and will only be made available to supervisors, tutors and the course management team.

Secured storage of data. All data will be stored and processed safely by the SSE and will be permanently deleted when the project is completed.

No personal data will be published. The thesis written by the students will not contain any information that may identify you as participant to the survey or interview subject.

Project Title Master Thesis Harrison Mohandas and Josch Walder	Year and semester Spring 2023
Aim of the study How do different organizations (mgmt. consultancies) utilize Strategic Heuristics in their approach to cope with uncertainty marked by digital transformation?	
Students responsible for the study or interview Josch Walder (42063) & Harrison Mohandas (42067)	
Supervisor and department at SSE Åke Freij at the Department of Entrepreneurship, Innovation and Technology	Supervisor e-mail address ake.freij@hhs.se
Type of personal data about you to be processed ▪ Recordings of the interview ▪ Name ▪ Job position ▪ Years spent at the firm	

To be completed by the interviewee:

I have taken part of the information provided above and consent to take part in this study:

Name	Place and date
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Exemplary Interview Questions

Introductory Question:

Could you please, from your perspective, summarize what your firm's current endeavours related to AI and Data Analytics are?

Probing Questions:

What is the underlying approach you are using regarding ...?

How did this approach evolve over the years?

How do you think it will this technology impact your consultancy in general and also this approach you mentioned?

You talked about the concept of rules or guidelines regarding adopting AI. Also, specifically, Generative AI. Could you maybe elaborate on that?

How do you then arrive at the decision to actually invest in a certain technology?

How do you assess whether those tools are appropriate for the problem that you want to solve?

And those are then partly internal capabilities and partly external ones? If you could just elaborate on what you just said?

What kind of solution is it exactly?

So, there's more or less a change of appointments in the upcoming years. Is that basically what you've mentioned right now?

What does such a make-or-buy decision, you just mentioned, look like?

Closing Question:

Looking back at the last 30 minutes, is there anything on your mind that you have not yet addressed regarding the topic, but you would still consider relevant?