

University of Groningen

## Driving digital transformation: integrative insights on organizational, environmental and managerial drivers

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DOI:  
[10.33612/diss.248358184](https://doi.org/10.33612/diss.248358184)

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*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2022

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Nguyen, K. (2022). *Driving digital transformation: integrative insights on organizational, environmental and managerial drivers*. University of Groningen, SOM research school.  
<https://doi.org/10.33612/diss.248358184>

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## CHAPTER 1

### GENERAL INTRODUCTION

We are living in a digital world where digital technologies become increasingly prevalent in many aspects of life, including how we work, shop, communicate with others, take care of our health, and spend our leisure time. Digital technologies, including information, computing, communication, and connectivity technologies (Bharadwaj et al., 2013; Vial, 2019), have a huge impact on organizations. More than the adoption of new technologies or digitizing a business process, digital technologies pervasively change organizations. To adapt to and take advantage of this shift, companies are continuously evolving around digital technologies, which makes digital transformation a strategic imperative for many firms.

Digital transformation is attractive for firms because of its strategic benefits, as firms create and capture value differently with the help of digital technologies. Research has shown that digital technologies help streamline business processes and improve operational efficiency (Fitzgerald et al., 2014; Svahn et al., 2017; Vial, 2019). Digitally enabled solutions also enable firms to upgrade their offerings, leading to a fundamentally different and potentially better customer experience. Additionally, digital technologies allow firms to operate in (new) markets through expanding to other industries and/or developing novel business models, thereby empowering them to generate additional revenues. For these reasons, thousands of companies in multiple industries are attempting digital transformation. For instance, in the food and hospitality industry, Domino uses an artificial intelligence-enabled chatbot to improve responsiveness to customers and engender trust. Likewise, Audi, a German car manufacturer, tailors a seamless omnichannel experience for customers using digital technologies. Audi's digital showrooms compile different digital affordances such as virtual viewing and trial, online discussion, and

review, as well as the interactive setting for advanced car reconfiguration. Several examples from the US retailing industry also shows how digital technologies can revolutionize the market, alter customer expectation and provide unique advantages. As one of the most outstanding examples, Amazon utilizes digital technologies to transform book retailing and continues to expand and upgrade its business model to become the leading online retailer<sup>1</sup>. Similarly, Target, a retail incumbent, introduced online shopping to its business model. In addition, Target combines online shopping with its unique advantages of physical stores to create a seamless online and offline experience for the customer. Its effective use of digital technologies enables Target to successfully enter new markets and realize increased revenues<sup>2</sup>. The extensive list of examples of successful digital transformation demonstrates the limitless potential of digital technologies for firms to create new value and become more competitive.

While benefits are there for the taking, they are not readily available to all firms attempting digital transformation. Many firms fail in the process of digital transformation. Past studies have shown that about two-thirds of digital transformations fail, losing billions of dollars to failed attempts<sup>3</sup>. Regrettably, such failure does not only incur a great loss but also puts the firm at a strategic disadvantage because even digital laggards consider digital technology adoption a top priority (Brock and von Wangenheim, 2019; Hansen et al., 2011). Importantly, the literature has noted numerous digital transformation failures from high-profile organizations such as Procter & Gamble, General Electrics, and Ford (Davenport and Westerman, 2018). Possessing financial

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<sup>1</sup> [https://www.business-standard.com/article/international/from-selling-books-to-redefining-retail-how-amazon-bezos-changed-world-121020400167\\_1.html](https://www.business-standard.com/article/international/from-selling-books-to-redefining-retail-how-amazon-bezos-changed-world-121020400167_1.html)

<sup>2</sup> <https://www.forbes.com/sites/shelleykohan/2020/03/04/targets-focus-on-employees-and-customers-delivers-revenue-growth-of-37-for-2019/?sh=6cebfb4154fa>

<sup>3</sup> <https://www.consultancy.uk/news/2656/two-thirds-of-digital-transformation-projects-fail>  
<https://www.bcg.com/publications/2020/increasing-odds-of-success-in-digital-transformation>  
<https://www.forbes.com/sites/forbestechcouncil/2018/03/13/why-digital-transformations-fail-closing-the-900-billion-hole-in-enterprise-strategy/?sh=63b7314d7b8b>  
<https://www.cnbc.com/2019/10/30/heres-why-ge-fords-digital-transformation-programs-failed-last-year.html>

resources and capabilities is insufficient for a successful digital transformation. Intrigued and inspired by these examples, I<sup>4</sup> set out to examine how and why a firm succeeds (or fails) in its digital transformation endeavors. As the essence of my research, this dissertation aims to advance the understanding of digital transformation and its drivers. This dissertation starts by reviewing what we have learned about digital transformation in the next section.

## **1.1. WHAT WE ALREADY KNOW: DEFINITIONS, BENEFITS, AND VALUE-GENERATING MECHANISMS OF DIGITAL TRANSFORMATION**

Digital transformation is a complex phenomenon that has been viewed from different perspectives, and that has led to a plurality of definitions. Focusing on the IS literature, Vial (2019: 118) defines digital transformation as *a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies*. With a management and change focus, Hanelt et al. (2020: 1160) specify digital transformation as *organizational change that is triggered and shaped by the widespread diffusion of digital technologies*. Finally, drawing on a wider range of disciplines, Verhoef et al. (2021: 889) propose digital transformation to be *a change in how a firm employs digital technologies to develop a new digital business model that helps to create and appropriate more value for the firm*. Although the definitions vary, scholars agree that digital transformation centers on the business application of digital technologies and aims to deliver greater value for the focal organization. Past research also makes substantive efforts to define what constitutes digital technologies and they are consent that those digital technologies broadly

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<sup>4</sup> It is important to note that although this dissertation is my original work, each chapter is a collective output with my supervision team: Peter C. Verhoef, Thijs Broekhuizen and John Qi Dong.

cover information, computing, communication, and connectivity technologies (Bharadwaj et al., 2013; Vial, 2019).

In this conceptualization phase, past studies identify the characteristics of digital transformation. Digital transformation is known to be disruptive and may substantially change different aspects of organizations, including the processes, the value creation logic, and the identity of the firm (Vial, 2019; Wessel et al., 2020). Digital transformation capitalizes on the use and combination of advanced digital technologies such as big data analytics, social media, and artificial intelligence to enable major improvement in the organization (Bharadwaj et al., 2013; Vial, 2019). Moreover, digital transformation often has consequences beyond the firm's boundary, influencing the wider ecosystem (Hanelt et al., 2020). As such, the loci of uncertainty associated with digital transformation are both internal and external (Vial, 2019). Finally, similar to a major change process, digital transformation is a pervasive and risky strategic endeavor (Verhoef et al., 2021; Vial, 2019).

Alongside the conceptualization of digital transformation, empirical research also provides evidence on its implications and the mechanisms leading to those implications. At the firm level, past research has shown that digital transformation can potentially improve organizational performance (see e.g., Hanelt et al. 2020; Vial 2019). Nwankpa and Roumani (2017) propose that digital businesses enabled by IT capabilities drive firm performance. Dong and Yang (2020) argue that combining digital technologies (i.e., big data analytics and social media) bring additional market value to the firm. Digital transformation is delineated both as the driver and the facilitator in the process of generating business value.

The mechanisms through which digital transformation delivers its promises are also well established in the literature. Hanelt et al. (2020) summarize the mechanisms into two categories:

innovation and integration. First, digital transformation paves the way for firms to increase innovation processes and outputs, eventually leading to higher performance (Dong et al., 2021; Saldanha et al., 2017). Second, digital transformation promotes integration within firms, allowing them to operate more efficiently (Li et al., 2016; Trantopoulos et al., 2017). For example, digital technologies allow process automation, enabling firms to automate straightforward procedures and free human capital for cognitive intensive work (Li, 2020). Digital technologies facilitate internal communications and process management, allowing firms to optimally configure resources and operate efficiently (Borangiu et al., 2019; Chantias et al., 2019; Libert et al., 2016). Adding to these mechanisms, Vial (2019) also proposes that digital transformation can bring a better customer experience by upgrading the value proposition and using digital channels (Karimi and Walter, 2015; Li et al., 2018). Digital technologies support faster response time and provide quick and valuable insights into the market for decision-making. Finally, digital transformation increases the adaptivity and survivability of the firm in complex and dynamic environments (Ahmed et al., 2022; Felipe et al., 2020; Pavlou and Sawy, 2010).

With the continuing relevance and the enormous value of digital transformation, scholars also started to identify the drivers of digital transformation. However, past research often treats the drivers of digital transformation superficially both empirically and conceptually. For instance, as digital transformation resembles a major change process, a decentralized and flexible organizational structure and a change-embracing culture are thus expected to be the core enablers (Horlach et al., 2017; Svahn et al., 2017). Likewise, existing phenomena, like path dependency and inertia are automatically considered hindrances (Lucas and Goh, 2009; Roecker et al., 2017; Wenzel et al., 2015). Although there is anecdotal evidence from case study research on the influences of these factors, there has not been any attempt to validate the impacts of these

enablers and inhibitors. In addition, research in this tradition also follows dominant theories. As an example, dynamic capabilities and organizational flexibility have been continuously applied in studying drivers of digital transformation (Karimi and Walter, 2015; Nwankpa and Datta, 2017; Warner and Wäger, 2019; Yeow et al., 2018). As a result, not all drivers are sufficiently attended to, and past studies devote sporadic efforts to expanding the understanding of digital transformation drivers. A lack of understanding of less popular and more unique drivers of digital transformation is also part of the reason why many firms fail in their digital transformation journey. The objective of this dissertation is to investigate organizational, environmental, and managerial drivers of digital transformation. In the next section, I will point to some limitations of past research on the drivers of digital transformation.

## **1.2. WHAT WE DO NOT (YET) KNOW: INTEGRATIVE INSIGHTS ON THE DRIVERS OF DIGITAL TRANSFORMATION**

This section presents the gaps in the digital transformation literature, focusing on its drivers. Following past research (Hanelt et al., 2020; Liere-Netheler et al., 2018), I categorize the drivers into three main types: organizational, environmental, and managerial drivers. Organizational drivers are internal factors facilitating (or hindering) digital transformation. Environmental drivers are external conditions that are outside the control of a single firms. These conditions create disruptive technological wave necessitating firms' digital transformation (Vial, 2019). Finally, managerial drivers are individual characteristics of the most influential unit in the organization when it comes to digital transformation – the top management team (Firk, Gehrke, et al., 2021). Each of the drivers has its research stream with unique underlying logic and assumptions. I



synthesize the characteristics of digital transformation of past research concerning its organizational, environmental, and managerial drivers to derive the relevant research gaps.

**A theoretical gap in research on organizational drivers:** Past research on organizational drivers of digital transformation often focuses on organizational capabilities that facilitate the major change process. This is because organizations often operate based on existing processes, resources, and cultures (Benner, 2007; Lavie, 2006; Ranganathan et al., 2003), and thus digitally enabled change is often a major challenge for them. Dynamic capabilities enable flexibility in the organization and allow the focal companies to manage digitally induced changes (Felipe et al., 2020; Lee et al., 2015). As digital transformation entails high uncertainty and dynamism; flexibility deems even more relevant (Pavlou and Sawy, 2010; Zhang, 2006). Nevertheless, whether organizational flexibility alone is beneficial for firms is still in question (see e.g., Herhausen et al., 2021). Research on radical innovation (with likely involves major changes in the organization) shows mixed results on the effect of flexibility. Similarly, the digital transformation also shows that flexibility in terms of resources, processes, and culture might not be beneficial for certain aspects of digital transformation (Karimi and Walter, 2015). In the context of digital transformation, possession of relevant capabilities is just one piece of the puzzle. Practical examples have shown that resourceful and capable firms can also fail in their digital transformation attempts (Davenport and Westerman, 2018). To overcome the capability-centric view, the literature has proposed that awareness of digital technologies and the motivational factor should be combined with flexibility to drive digital transformation (Hanelt et al., 2020; Vial, 2019), yet awareness and motivation receive much less attention and appear mostly from anecdotal evidence from case study research (Alos-Simo et al., 2017; Dery et al., 2017; Hansen et al., 2011; Lucas and Goh, 2009). Thus, the first gap this dissertation plans to

bridge is the holistic approach that focuses on the synergistic effect of organizational drivers on the success of digital transformation.

**A theoretical gap in research on environmental drivers:** The extant literature demonstrates that external environments play a key role in digital transformation. Vial (2019) demonstrates that digital transformation is a response to environmental disruption such as changes in customer expectations or the rise of new technologies. Industry-specific characteristics are also recognized as the environmental driver for digital transformation (Hanelt et al., 2020; Vial, 2019; Wamba and Chatfield, 2009). Interestingly, however, past research has not examined the influence of industry-specific characteristics on the reconfiguration of organizational drivers of digital transformation. In other words, the importance of digital transformation drivers might not be equivalent across firms (Caldwell, 2013; Chiasson and Davidson, 2005). Firms are inseparable from their environment, and the environment requires different elements to be successful with digital transformation (Chae et al., 2018; Otim et al., 2012). Industry characteristics play a major role in determining the value of technologies (Anderson et al., 2006; Chatterjee et al., 2001). If firms mindlessly follow a strategy to foster their digital readiness without considering these environmental factors, failure is more likely. In short, the second gap is to address the lack of knowledge on how environmental drivers of firm strategy impact digital transformation.

**A theoretical gap in research on managerial drivers:** Top management involvement has been a central topic in digital transformation (Choi et al., 2021; Firk, Gehrke, et al., 2021; Kohli and Melville, 2019). The digital transformation is pervasive and can substantially change the organization, ranging from the value creation mechanisms to its own identity (Wessel et al., 2020). To maintain alignment and facilitate the integration of new technologies, TMT is of paramount importance (Benlian and Haffke, 2016; Karahanna and Preston, 2013). Past research

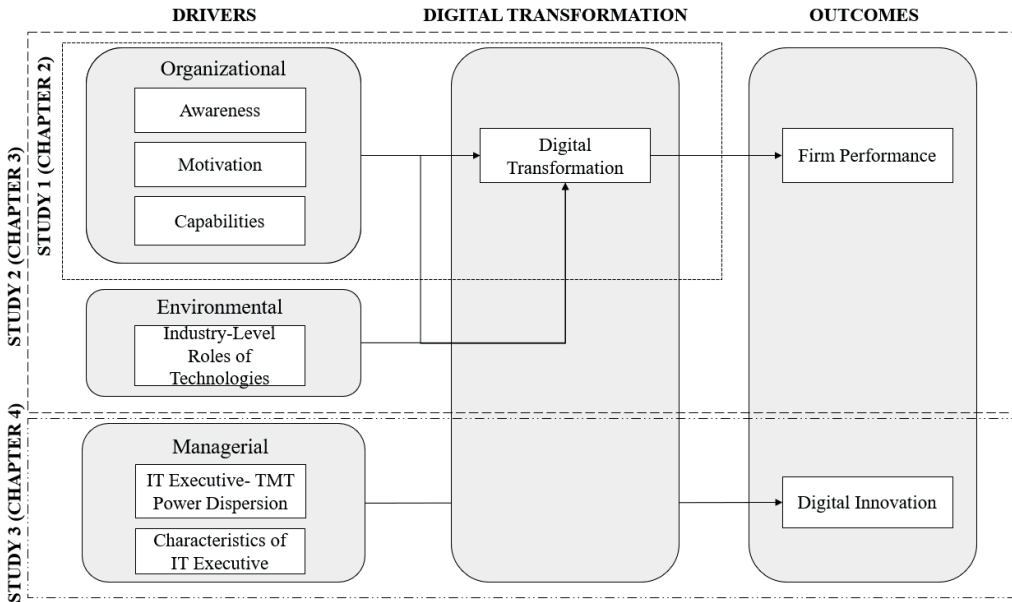
has explored the characteristics of TMT as driving digital transformation. However, most studies focus on the advantage of digital knowledge of TMT members that allows them to recognize the benefits of digital transformation as well as to understand and develop a suitable strategy for the firms (Firk, Gehrke, et al., 2021; Hansen et al., 2011; Lim et al., 2013). However, top management involvement stays modest as there is a lack of digital vision and a sense of urgency, and digital knowledge might be necessary but not sufficient for TMT engagement (Fitzgerald et al., 2014). In this regard, the literature has highlighted that digital transformation is inherently a risky, costly, and disruptive process that will not align with risk-averse top members (Choi et al., 2021; Wright et al., 2007). In addition, digital transformation requires heterogeneous top managers to collaborate, yet not all of them share the same vision that the firm should engage in digital transformation as well as the willingness to collaborate (Firk, Gehrke, et al., 2021). Hence, it is crucial to identify the managerial drivers that are relevant to both the motivation and collaboration of TMT members.

While digital transformation and its drivers are increasingly studied, we do not fully understand how to drive the complex and dynamic process. Although there has been anecdotal evidence on organizational, environmental, and managerial factors driving digital transformation, each stream has operated in relative isolation or experienced drawbacks that prevent our understanding. The next section will give an overview of the three empirical chapters constituting this dissertation. Based on the summary of each chapter, I will propose research strategies to address the above-mentioned theoretical gaps.

### **1.3. OVERVIEW OF THE DISSERTATION**

To address the potential gaps in the literature on organizational, environmental, and managerial drivers, this dissertation draws on highly relevant management theories to provide a more in-depth understanding of digital transformation drivers. Particularly, chapter 2 augments the awareness-motivation-capability framework with systems theory to address the mixed findings on the influence of organizational flexibility and digital transformation and identify the complementarity of organization drivers toward digital transformation. Chapter 3 builds upon the relevant organizational drivers in chapter 2 and combines them with the strategic IS literature to introduce the shaping role of the industries on digital transformation drivers. Chapter 4 leverages the power dispersion literature to shed light on the impact of TMT relative power and digital transformation. Relative power is potentially relevant to both the motivation and the collaboration in the TMT.

Taken together, the dissertation provides a comprehensive picture of the organizational, managerial, and environmental drivers of digital transformation. The findings depart from the literature and advance our understanding of the digital transformation drivers. In addition, when examining digital transformation, this dissertation moves beyond the degree of firms' digital transformation and examine the various reflection of a successful digital transformation such as the enablement of digital technologies for increased performance or innovation. Figure 1.1 delineates the three empirical chapters and their focuses.



**Figure 1.1. Research model of the dissertation**

### 1.3.1. Complementarity of Organizational Drivers: A Systems Theory Perspective

Chapter 2 delineates the results of study 1. A review on the extant empirical studies identifies that past research focuses on the organizational capability driver related to changes. Change capabilities are argued to reinforce organizational flexibility and allow firms to adapt to and overcome the hindrances of changes. However, given the mixed findings on the role of organizational flexibility and radical innovation outcomes (Li et al., 2010, 2017; Miroshnychenko et al., 2021; Zhou and Wu, 2010), this chapter aims to examine the condition under which organizational flexibility is conducive to digital transformation.

Study 1 addresses this gap by comprehensively considering awareness, motivation, capability drivers, and more importantly the synergy among the three drivers. While each of these

three drivers permeates the digital transformation literature (Hanelt et al., 2020; Vial, 2019), the first two have been under-explored. Leveraging the awareness-motivation-capability (A-M-C) framework, this study identifies digital proactiveness (awareness), change commitment (motivation), and organizational flexibility (capability) as three separate but interacting drivers. Drawing on systems theory to theorize the synergy of digital proactiveness, change commitment, and organizational flexibility in driving digital transformation (Nevo and Wade, 2010; Tanriverdi, 2005), this study develops and empirically tests hypotheses using survey data of 206 Dutch SMEs from the Northern Netherlands innovation monitor survey in 2019. The results support a synergistic, three-way interaction effect of the three drivers. In an attempt to explore the mixed findings on flexibility and digital transformation, an additional complementarity analysis is conducted. It reveals that that organizational flexibility positively influences digital transformation only when digital proactiveness and change commitment are simultaneously present.

### **1.3.2. Configuring Effect of Environmental Drivers: A Context-Specific Perspective on Digital Readiness**

Chapter 3 presents the results of study 2 on the role of industries in shaping a firm's strategy for fostering digital readiness. Digital readiness – the capacity that an organization is prepared for digital transformation (Rafferty et al., 2013; Weiner et al., 2008) – is often considered critical for firms engaging in digital transformation. Building on the theory of organizational readiness (Weiner, 2009) and supported by study 1, study 2 construes that digital readiness consists of complementary resources, digital capabilities, and commitment to transformation. However, upon inspecting the digital transformation literature, I find that there is limited understanding of how

industry characteristics shape and configure digital readiness dimensions. Readiness is a context-specific construct, such that the dimensions of digital readiness may depend on not only the focal firm but also the industry in which it operates. If digital technologies play various roles in different industries, there will be diverse needs for firms in terms of digitalization. As a result, digital readiness may imply different things across industries, and, hence, could be differently constructed across industries.

Drawing on the industry-level strategic role of technologies literature (Chae et al., 2018; Otim et al., 2012), this study categorize industries into more and less intensive groups (namely transform and informate industries, respectively). This study contends that in the more intensive industries (i.e., transform industries), firms face high technological dynamism and competitive pressures. On the other hand, firms in less intensive industries (i.e., informate industries) face different challenges to digital transformation due to their lack of urgency and higher learning curve in institutionalizing digital technologies. These two groups of firms may require different configurations of digital readiness dimensions to realize digital transformation as well as to extract business value from this complex process. These propositions are explored using survey data of 536 Dutch SMEs from the Northern Netherlands innovation monitor survey in 2020. A mixed-method approach sequentially combining the configurational method (qualitative comparative analysis) and the correlational analysis (linear regression) is employed to adequately examine the configurations of digital readiness as well as the business values of digital readiness configurations.

### **1.3.3. Incentive-Inducing and Collaboration-Enabling Effect of Managerial Drivers: An IT Executive – TMT Power Dispersion Perspective**

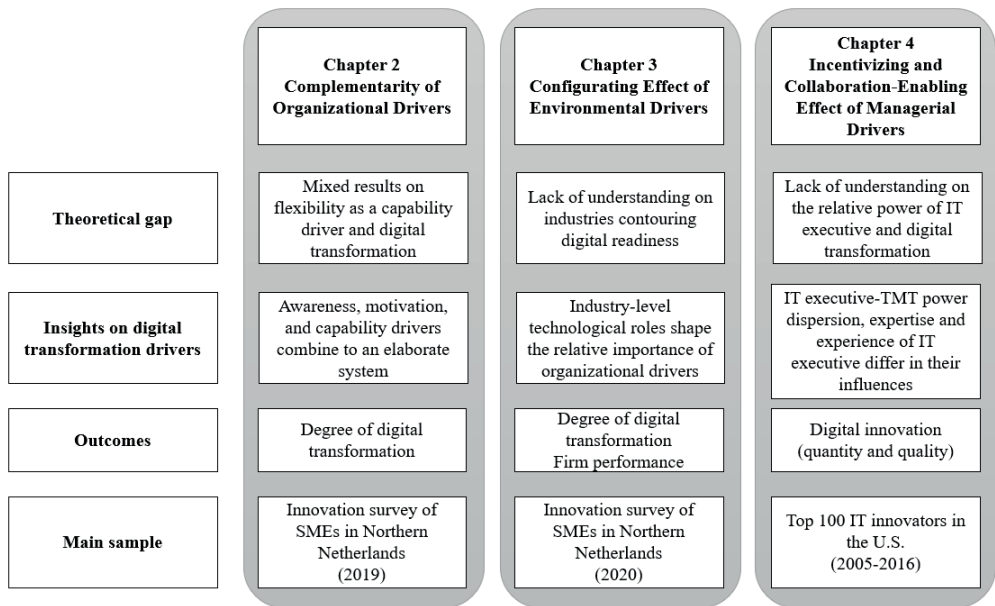
Chapter 4 demonstrates the results of study 3 focusing on the relative power of IT executives and digital innovation performance. The respective literature has shown that top management team (TMT) and its key members are vital in managing and leading digital transformation (Singh et al., 2020; Tumbas et al., 2018)) and particularly in innovating with digital technologies (Choi et al., 2021; Firk, Gehrke, et al., 2021; Kohli and Melville, 2019). This literature, however, focuses on cognitive (e.g., expertise) and affective characteristics (e.g., attitude) as important managerial factors in driving digital innovation. Study 3 argues that cognitive and emotional characteristics are not sufficient in this process, because digital transformation is complex, risky, and uncertain. Motivation for executives to engage in these strategic activities is thus important because top managers are often risk- and uncertainty-averse (Wright et al., 2007). Second, digital transformation necessitates cross-functional collaboration in the TMT.

Study 3 proposes that, next to digital knowledge, the relative power of the IT executive in the TMT should not be overlooked because of its relevance to both requirements of motivation and collaboration. Relative power is a managerial driver in the context of digital transformation and innovation that has received little attention in the digital transformation literature. Using insights on the benefits and costs of power dispersion in extant research, study 3 hypothesizes an inverted U-shaped relationship between the power dispersion of the IT executive and the TMT on digital innovation. A moderate level of IT executive-TMT power dispersion has incentivizing mechanisms that motivate the IT executive to engage in and contribute to digital innovation. However, a high level of power dispersion disrupts the cooperation in the TMT by erecting collaboration barriers. In the subsequent hypotheses, this chapter leverages the digital innovation



literature to theorize the moderating role of the IT and business expertise of IT executives. It argues that IT expertise steepens the inverted U-shaped relationship intensifying both the incentivizing benefits and the collaboration costs, while firm-specific (business) expertise flattens the inverted U-shaped relationship by reducing both mechanisms. To examine these hypotheses, a unique panel data set of the top 100 U.S. IT innovators spanning 12 years (2005-2016) is constructed.

Figure 1.2 provides a summary of the three empirical studies that shed light on the gaps the dissertation aims to address, the new insights on digital transformation drivers, the outcomes in these studies, and the main samples used for the empirical analyses.



**Figure 1.2. Overview of the dissertation**

