
A. Foundation

The first part of this thesis is divided into two chapters. The first chapter (A.I) explains the motivation for this work and illuminates the research gaps as well as the resulting questions. Furthermore, it presents the structure, design, research context, and anticipated contributions of this cumulative dissertation. Afterwards, the second chapter (A.II) provides the relevant theoretical background.

I. Introduction

The first section, A.I.1, highlights the motivation for and relevance of the research. This section is followed by a description of the research gaps and questions (A.I.2) and the structure of the thesis (A.I.3). Section A.I.4 elucidates the context and design of the research. Finally, Section A.I.5 concludes this chapter with a description of the anticipated contributions for research and practice.

I.1 Motivation

Strategy is often defined as a set of committed choices made by management and a contingent plan of actions and activities designed to achieve a particular goal (Casadesus-Masanell and Ricart 2010). As such, Quinn (1993, p. 23) states that “a well-formulated strategy helps to marshal and allocate an organization’s resource into a unique and viable posture based on its relative internal competencies and shortcomings, anticipate changes in the environment and contingent moves by intelligent opponents.”

The ongoing digital transformation is a major environmental change that companies are faced with and have to adapt to (Matt et al. 2015). This change involves the ongoing diffusion of digital technologies throughout almost every aspect of everyday life (Yoo 2010), resulting in a ubiquitous digital infrastructure (Tilson et al. 2010) and changing customer expectations based on digital experiences (Lucas et al. 2013). Even if digital technologies have affected business since their inception (e.g. Oestreicher-Singer and Zalmanson 2013; El Sawy and Pereira 2013; Venkatraman 1994), scholars and practitioners agree that the role of digital technology has changed over time, and they stress the transformational role of digital technologies in contemporary business (Banker et al. 2006; Lu and Ramamurthy 2011; Sambamurthy et al. 2003; El Sawy 2003). For instance, instead of solely being a support function for increasing business process efficiency and firm productivity, digital technology nowadays directly affects the mechanisms through which value is created and captured, and thus it matters for business success (Bharadwaj et al. 2013; Drnevich and Croson 2013; Mithas et al. 2012). Hence, digital transformation has become a strategic imperative on leadership agendas (Fitzgerald et al. 2014; Hess et al. 2016; Singh and Hess 2017), as it goes far beyond functional thinking, and comprehensive actions must be taken to exploit the opportunities or avoid the threats that stem from such technologies (Singh and Hess 2017).

In general, there is common agreement that digital technologies challenge conventional norms of product architecture, ownership, roles, rules, and relations to other actors (Woodard et al. 2013). This is expressed by, for instance, the increasing integration of digital technologies in products and services and the difficulties of disentangling digital products and services from their underlying digital infrastructure (Orlikowski 2009; Pavlou and El Sawy 2010). With embedded digital capabilities, formerly physical products offer novel functions and remarkably improved price/performance ratios, with their design, production, distribution, and use transformed (Yoo et al. 2010). At the same time, the structure of social relationships in both the consumer and enterprise spaces has been transformed due to digital

technologies (e.g. Susarla et al. 2012). This results, for example, in consumers being involved in the value-creation process (e.g. Oestreicher-Singer and Zalmanson 2013; Qi Dong and Wu 2015) and companies being engaged in innovation ecosystems based on digital platforms (Helfat and Raubitschek 2018; Teece 2018a). Furthermore, “born digital” pioneers such as Google, Amazon, and Facebook have created “a new generation of competition,” challenging the conventional wisdom of traditional competition (Sebastian et al. 2017; Teece and Linden 2017; Warner and Wäger 2019). In general, the company’s environment has become more dynamic and fast-moving, and competitive advantage has become short-lived and increasingly fleeting. On the other hand, digital technologies also enable different forms of dynamic capabilities suitable for such turbulent environments (Pavlou and El Sawy 2006, 2010) and they alter a company’s set of possible competitive moves (Mithas et al. 2013; Woodard et al. 2013). This makes it necessary to embed digital technology in business strategy, leading to an overarching phenomenon called the digital business strategy (DBS) (Bharadwaj et al. 2013; Coltman et al. 2015), which is defined as an “organizational strategy formulated and executed by leveraging digital resources to create differential value” (Bharadwaj et al. 2013, p. 472).

In light of these aforementioned effects, companies have to find solutions for how to remain competitive and adapt their business strategies, as digital technologies provide game-changing opportunities for and existential threats to companies (Sebastian et al. 2017; Vial 2019). This is reinforced by the statement of Teece (2018b), who argues that, in many cases, business model design is determined by strategy but that general-purpose technologies, such as the Internet, open up opportunities for radically new business models to which strategy must then respond. Thereby, changes in business strategy relate to the most radical levels of IT-enabled business transformation (Venkatraman 1994) as well as to organizational transformation in general (Besson and Rowe 2012). This highly complex change process requires a series of calculated and interdependent strategic decisions (Aspara et al. 2011; Velu and Stiles 2013). Concurrently, incumbents frequently lose their advantage after discontinuous technological change (Abernathy and Utterback 1978; Christensen and Bower 1996; Henderson and Clark 1990; Tripsas and Gavetti 2000; Tushman and Anderson 1986). The reasons for this are manifold. For example, for companies with a primarily physical core product and a business model based on it, there is, above all, an inevitable need to deal with tensions arising from the combination of the digital and physical aspects (Hanelt et al. 2015).

At the same time, incumbents are often constrained by path dependencies and inertia as executives tend to make use of prior experiences and favor strategic choices they are familiar with over unfamiliar options (Gavetti and Levinthal 2000; Thietart 2015). Over time, due to the replication of familiar strategic patterns, the company’s option space of competitive moves is gradually reduced ultimately leading to a lock-in (Koch 2011; Sydow et al. 2009). As a consequence, companies may stick to a specific path (Schreyögg and Sydow 2011) which restrains transformational change. This is reinforced by the fact that digital technologies are “fundamentally reshaping traditional business strategy as modular,

distributed, cross-functional, and global business processes that enable work to be carried out across boundaries of time, distance, and function" (Bharadwaj et al. 2013, p. 472). This makes it even harder for incumbent firms to alter their business strategies as traditional wisdom of competitive strategy in many cases becomes obsolete (e.g. Chanias et al. 2019; Vial 2019; Warner and Wäger 2019). At the same time, these often-heralded digital technologies, have, due to their characteristics of being reprogrammable, as well as homogeneous and self-referential in nature (Yoo 2010), the potential to increase a company's strategic flexibility, thus, altering a company's path dependence and restore choices.

Given the importance of these topics for contemporary managerial practice, an increasing number of researchers have been devoting themselves to the research area of digital business strategy (Vial 2019). In doing so, they have increased the understanding and underpinned the importance of a digital business strategy for a company's success by further elaborating the concept (e.g. Drnevich and Croson 2013; Mithas et al. 2013; Woodard et al. 2013) and investigating the performance implications of such a strategy (e.g. Leischnig et al. 2017). Even though valuable advances have undoubtedly been made by these research efforts, certain gaps remain.

Accordingly, this thesis sets out to advance the understanding of, first, the digital business strategy concept in general as well as its influence on a company's performance. Second, the phenomenon of digital transformation as it manifests itself in the evolution of incumbents' digital business strategies. In doing so, this thesis empirically investigates generic types of digital business strategy. Moreover, the individual digital business strategy types are linked to a company's overall performance, operationalized by Tobin's Q and strategic flexibility. Furthermore, the study elucidates the ongoing digital transformation as it manifests itself in the evolution of incumbents' digital business strategies. In doing so, the study examines how the concept of path dependency differs in the context of digitalization by validating prevailing assumptions in the literature and deriving implications for a new understanding. In addition, the thesis at hand assumes that business models describe a company's underlying logic (Al-Debei and Avison 2010) and accordingly reflect a company's realized strategy (Casadesu-Masanell and Ricart 2010). It thus uses the concept of business models as a conceptual tool to analyze digital business strategies. Therefore, it links both concepts more closely (Teece 2010). Hence, in sum, this work aims to contribute to specific gaps in information systems (IS) research with respect to the concepts of digital business strategy, digital transformation, and path dependence. It also relates these concepts to one another, as the phenomenon in question demands.

In addition, this thesis seeks to derive important implications for business practice, as it helps practitioners to develop a better understanding of digital business strategies, especially considering that digitalization challenges the conventional wisdom of competition. This is particularly important, as with increasing digitalization, tightly integrated digital business strategies will be among the biggest determinants of a company's future success (Westerman et al. 2012). At the same time, digital technology is subject to strong hype

cycles, resulting in a kind of management fashion. Managers are quick to give immediate attention to digital topics without their relevance being scientifically or practically proven. As a consequence, companies see different possibilities and undertake various approaches (Dawson et al. 2017). This, in turn, leads to a high degree of uncertainty as to which options to choose and which strategy to pursue, while taking important factors, such as applicability and feasibility, into account. The study thus seeks to provide guidance for industrial-age incumbent managers when developing a digital business strategy.

I.2 Research Gaps and Research Questions

As outlined above, this study investigates the digital business strategy phenomenon as well as its implications on a company's performance and links it with the digital transformation of incumbent firms. For the sake of simplicity, the research object is divided into three different parts, each of which is represented by a specific research question (RQ). In the following, the research questions are briefly explained. Subsequently, Figure A-1 provides an overview of the topics covered by them. Chapter A II provides a detailed theoretical background.

In the past, the majority of research has seen IT strategy from an operational and/or project implementation perspective (e.g. Bakos and Treacy 1986; Henderson and Venkatraman 1993). The general conception treated IT strategy as a functional-level strategy that must be aligned with the firm's chosen business strategy (Yeow et al. 2018), resulting in the widespread under-appreciation of the business-level role of IT (Bharadwaj et al. 2013; Mithas et al. 2013). On the other hand, current research has proven that IT alters the business-level strategic alternatives to value creation and capture, resulting in a fusion of the concepts of IT strategy and business strategy into an overarching phenomenon called the digital business strategy (e.g. Bharadwaj et al. 2013; Drnevich and Croson 2013; Leischnig et al. 2017; Mithas et al. 2013; Oestreicher-Singer and Zalmanson 2013; Woodard et al. 2013). Nevertheless, although valuable advances have undoubtedly been made by these research efforts, certain gaps remain.

First, although IS research has already studied digital business strategies, most research has taken a static view by, for example, describing components or specific instances of digital business strategies (e.g. Pagani 2013; Woodard et al. 2013), and has thus further developed and validated the concept in a primarily theoretical manner. Nevertheless, until now, empirical evidence of how digital business strategies manifest themselves in real companies is missing, and there is a special need for a framework for the categorization of different types of digital business strategy (Kahre et al. 2017). Strategic management research, on the other hand, has focused a great deal of attention on developing taxonomies of generic strategies to describe strategic choices with ample applicability across industries and organizational forms (Herbert and Deresky 1987). Simultaneously, they usually date back to the pre-digital era. However, as IS research points out, in the course of digitalization and with the resulting digitally fused environments, the wisdom of traditional business strategy has changed, thus questioning the timeliness of traditional strategy typologies. The typology of Miles and Snow (1978) is of particular interest, as it addresses patterns of strategic behavior

(i.e. a company's tendency to innovate, lead, and take risks) and, consequentially, a company's alignment process with perceived environmental conditions. This leads to the question of whether the typology of Miles and Snow (1978) is still applicable, as digitally fused environments may require different strategic behavioral principles. The same applies to the strategy content aspect of digital business strategies. Here, Bharadwaj et al. (2013) have identified the four core themes—*scope, scale, and speed of digital business strategy*, as well as *sources of business value creation and capture*—that they believe encompass the core attributes of a digital business strategy, and help to elaborate its nuances. In addition, Drnevich and Croson (2013) use the categorization of casual profit mechanisms derived by Makadok (2010, 2011) to emphasize how IT affects the mechanisms through which a company creates and captures value to earn a profit differently. However, there is a lack of research with regard to quantitative approaches to generalize and test these emerging theories (Kahre et al. 2017) and transfer them into industry-spanning, applicable generic types of digital business strategy with regard to value-creation mechanisms.

Therefore, this study addresses, among others, the following research question:

RQ1: How can the digital business strategies of companies be differentiated into generic types based on strategic behavior and value-creation mechanisms?

Second, firm performance is widely considered to be the fundamental domain that strategic management research deals with (Durand et al. 2017). Several efforts have been made to study this outcome variable in the context of digital business strategies. Nevertheless, it is evident that the impact of a digital business strategy on organizational outcomes and reciprocal feedback mechanisms has not been examined sufficiently enough (Kahre et al. 2017). Most of the studies are limited to the mere proof that digital technologies contribute to the business success of companies (e.g. Drnevich and Croson 2013; Mithas et al. 2012) in order to validate the digital business strategy construct. Only a few examine the implications of a digital business strategy on a company's performance per se (e.g. Leischnig et al. 2017; Mithas and Rust 2016). In addition, and as already mentioned, a major shortcoming of all previous—and particularly conceptual—studies is their perception of a digital business strategy as a monolithic block and the missing differentiation with regard to possible generic digital business strategy types. Digital business strategies, however, can differ in terms of scope, scale, and speed, as well as the source of value creation and capture (Bharadwaj et al. 2013), and they can use different profit mechanisms (Drnevich and Croson 2013). Consequently, they influence a company's performance in different ways. In addition, while empirical studies elucidate the relationship between a digital business strategy and firm performance, its influence on alternative outcome variables, such as strategic flexibility, has only been conceptually described (e.g. Woodard et al. 2013) and an empirical investigation of this relationship has not yet been provided. Therefore, a more differentiated consideration is needed, shedding light on the influence that individual digital business strategy types have on different outcome variables describing a company's performance.

This leads to the second research question:

RQ2: How do different types of digital business strategy regarding their value creation mechanisms influence firm performance and strategic flexibility?

Third, an inherent part of a business strategy is the adoption mechanism of a company's strategy formulation process in response to its environment (Haj Youssef and Christodoulou 2017; Hambrick 1983). Much research has been undertaken to investigate strategic change in the digital age (Kahre et al. 2017). Thereby, the focus has merely been on the inner and outer context as well as the content when it comes to a holistic change perspective on a digital business strategy (e.g. Mithas et al. 2013; Oestreicher-Singer and Zalmanson 2013). "Current research therefore primarily addresses the 'why' and 'what' of change questions when it comes to DBS. However, research on the 'how' of change, which can only be understood from a detailed analysis of the process focusing on transformational changes, is scarce" (Kahre et al. 2017, p. 4711). This is in line with a lack of knowledge on the influence of path dependence on the evolution of a company's digital business strategy. To date, the concept of path dependence, especially, has been the subject of extensive research in the field of organization science. Nevertheless, these research projects describe path dependence rather conceptually and also do not consider digitalization as an influencing factor (Hannan et al. 2004; e.g. Sydow et al. 2009). On the other hand, even if prior work in the field of IS research has highlighted the disruptive impact of digitalization on incumbent firms (e.g. Karimi and Walter 2015; Lyytinen and Rose 2003), that work has merely focused on the business opportunities resulting from ongoing digitalization (Besson and Rowe 2012; Lucas et al. 2013; Sørensen and Landau 2015). Thus, the prior literature does not fully illuminate the problems of path-dependent firms facing the digitization of their business. This makes it necessary to gain a more nuanced understanding of how path-dependent firms respond to the disruptive impact of digital technology (Rauch et al. 2016). This blind spot is even more surprising, as there is common agreement that path dependence is the key challenge for incumbent firms in the face of digitalization (Besson and Rowe 2012; Karimi and Walter 2015).

This leads to the third research question:

RQ3: How do path dependencies influence the evolution of digital business strategies in industrial-age incumbent firms?

Figure A-1 expresses the research fields and their connections among themselves the individual research questions cover.

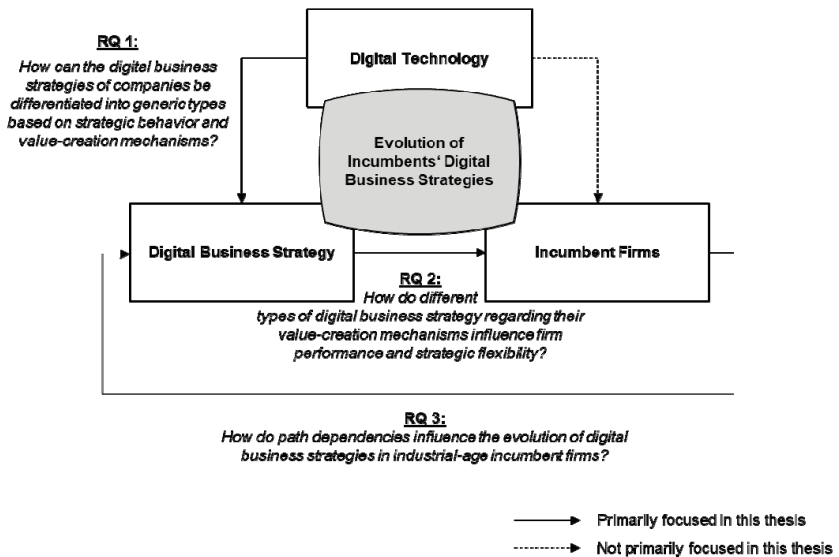


Figure A-1. Overview of the research questions.

I.3 Structure of the Thesis

This cumulative dissertation is divided into three parts. Part A explains the motivation for this research endeavor (A.I.1). Afterwards, it details gaps in the current research (A.I.2). In addition, the structure of the thesis (A.I.3), the research context and design (A.I.4), and the anticipated contributions (A.I.5) are presented in the first part. The following chapter (A.II) lays the theoretical foundation for a comprehensive understanding of the digital business strategy concept and its evolutionary trajectory in IS research, the transformational impact of digital technology on competition, and incumbent challenges in cases of disruptive change.

Part B represents the main body of this cumulative dissertation. It comprises three studies that all address different aspects of the phenomenon in question (see Table A-1)

Table A-1. Overview of the studies included in the thesis.

No	Outlet	Status	Ranking (VHB)	Section	RQ	Main contribution
1	International Conference on Wirtschaftsinformatik 2021	Published	C	B.I	1	Validation of the applicability of the generic strategy types developed by Miles and Snow (1978) regarding the strategic behavior of companies (tendency to innovate, lead, and take risks) in the digital context.
2	Journal of Strategic Information Systems	Under Review (1st round) ¹	A	B.I & B.II	1, 2	Development of four different digital business strategy types based on their digital value-creation mechanisms and the subsequent investigation of their influence on the performance and strategic flexibility of a company.
3	Research Policy	Under Review (3rd round) ²	A	B III	3	Investigation of the influence of digital technologies on the path dependencies of incumbent companies and the evolution of their business models.

In Part C, the last part of the cumulative dissertation, the findings are summarized and synthesized. Afterwards, theoretical and practical implications are derived. Finally, limitations and opportunities for further research are presented. Figure A-2 depicts the structure of the thesis in more detail.

¹ This article is based on a previous version that was accepted on the 16th International Conference on Wirtschaftsinformatik 2021, Duisburg-Essen

² This article is based on a previous version that was accepted on the 79th Annual Meeting of the Academy of Management 2019, Boston

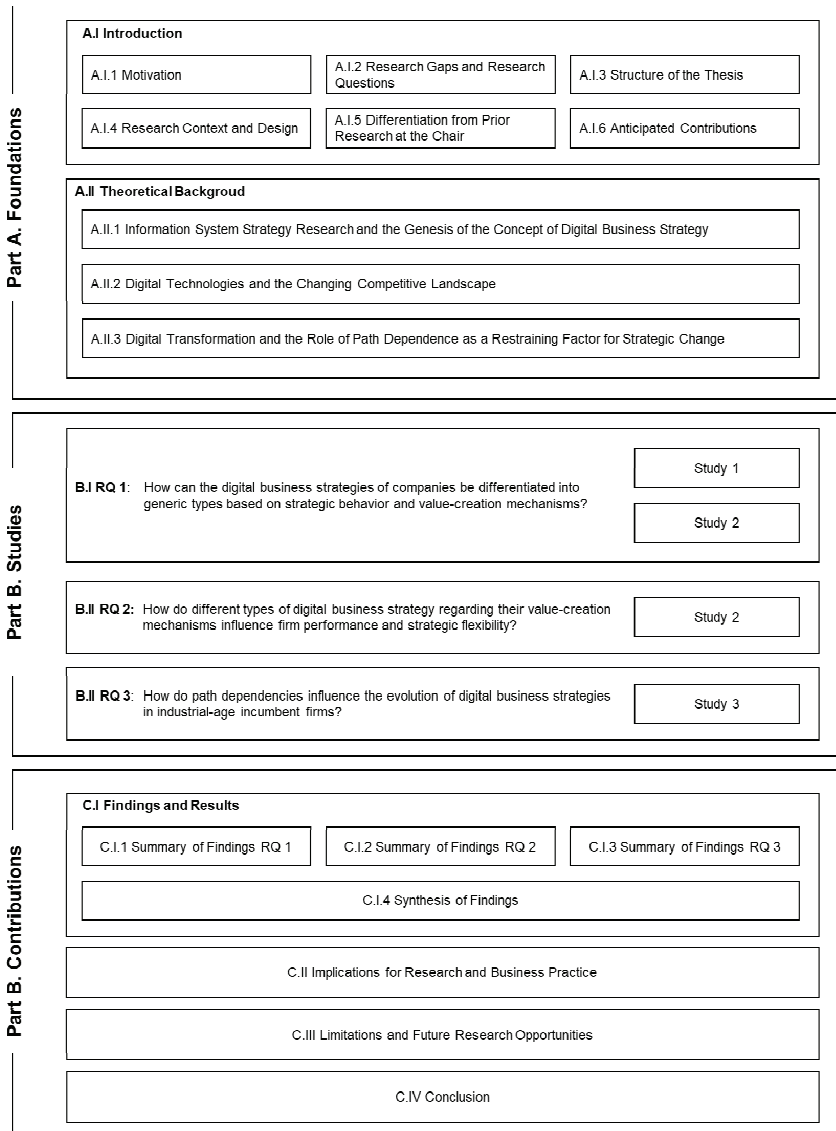


Figure A-2. Structure of the thesis.