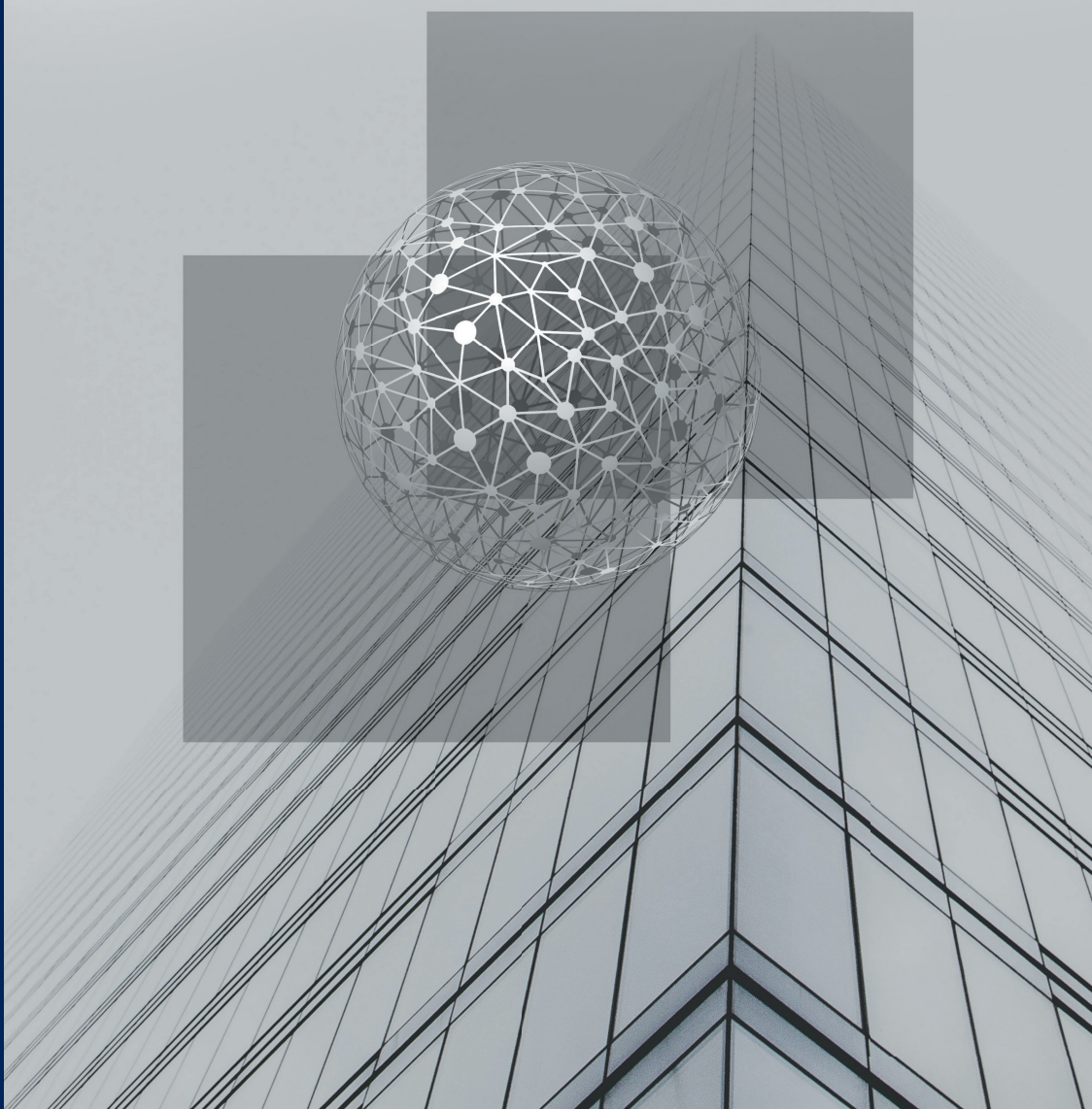


**MOHAMMAD TAGHI RAMEZAN ZADEH**

# **How firms cope with digital revolution**

**Essays on Managerial and Organizational Cognition**



**How Firms Cope with Digital Revolution**  
Essays on Managerial and Organizational Cognition



**How Firms Cope with Digital Revolution**  
Essays on Managerial and Organizational Cognition

**Hoe bedrijven omgaan met digitale revolutie**  
Essays over management- en organisatorische cognitie

Thesis

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Mohammad Taghi Ramezan Zadeh  
born in Ray, Iran

## Doctoral Committee

Promotors: Prof. dr. H. W. Volberda  
Prof. dr. J. P. Cornelissen

Other members: Prof. dr. D. Ravasi  
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To the memory of Aqajan, Aqa Asadollah Ramezan Zadeh (1934-2003)

به یاد آقاجان، آقا اسدالله رمضانزاده



## **Preface**

*Why is it necessary for a firm to adapt to change? Why shouldn't managers run the incumbent firm until it dies and open a new one when they want to innovate? What remains the same from an adapted firm? How can a firm change so that it can still claim the same name and recognition? These are the questions that may come to mind while contemplating incumbents' adaptation. As one can see by reading between the lines of these questions, the incumbent firm's adaptation requires inconsistency. It is challenging for academics and practitioners to explain, justify, and practice this inconsistency. How to change and remain the same has philosophical complexities that must be understood (Mortensen, 2020). I am fascinated by literature that sheds light on such inconsistency. This dissertation contains my research on the adaptation of established firms during the digital revolution. I managed to conduct this research with the support of many bright minds and kind souls.*

*As a PhD student, I was eager to learn about the fundamentals of management and how to conduct scientific research in the field of management. I benefited from great courses offered in the PhD in Management program at the Erasmus Research Institute of Management (ERIM), Erasmus University. It was a pleasure to obtain my PhD under the supervision of forward-thinking and supportive professors in the field of strategic management and organization studies. Professor Dr. Henk Volberda is a prominent strategy theorist who, at the same time, has clear insights into business practices. The autonomy he gave me in the research exploration phase helped me find my feet in the field. He contributed to my research by his critical approach to my research in later stages, too. I am thankful for his support in the ups and downs of my PhD journey as well as afterward, when I entered the job market. I would like to thank Professor Dr. Jan van den Ende for his critical evaluation and constructive comments on my work in the early stage of my research. Professor Dr. Joep Cornelissen's superb adeptness in theory-building made his class on theory development extremely valuable. I also had the opportunity to collaborate with him in a research project. It was a fantastic experience full of learning about writing theoretical pieces. It had previously been a pleasure to work with Dr. Saeed Khanagha at Ericsson, a telecommunications company based in Stockholm, and it was a pleasure to work with him again during my PhD program. His analytical mind, deep insight into the industry, and up-*

*to-date knowledge of the strategy and innovation fields made co-authorship with him a great source of learning. As a good friend, Saeed's support helped me settle in Rotterdam very quickly while I was beginning my PhD. My special gratitude goes to him for his advice and help with my research and while I was searching the job market. I extend my thanks to Dr. Oli Mihalache for his scholarly collaboration in the research we presented in this dissertation and for supporting my job applications. Also, I would like to thank Dr. Magdalena Cholakova for her professional and friendly attitude in our research project. Her open and constructive approach in discussions helped me improve my research skills. I full-heartedly thank my promoters and co-authors for their support and what I have learned from them.*

*I want to express warm gratitude to my former colleagues at the Department of Strategic Management and Entrepreneurship (SM&E), Rotterdam School of Management (RSM), Erasmus University. I would like to thank Ellen, Patricia, Caroline, Marleen, Natalija, Kim, and Miho for their administrative support at the SM&E and the ERIM. I would like to thank Professor Dr. Patrick Reinmoeller, Dr. Brian C. Pinkham, Dr. Mirko Benischke, Dr. Luca Berchicci, and Dr. Joost Rietveld for their constructive comments on my research in progress and in the brown-bag seminars of the SM&E. I extend my thanks to Dr. Frank Wijen, Dr. Murat Tarakci, Dr. Robert Roederkerkt, and especially Dr. Magdalena Cholakova—they gave me their honest and professional advice when I asked for it. I thank Dr. Anna Nadolsk, Dr. Jurriaan Nijholt, and Dr. Giuseppe Criaco for their help in designing and organizing my courses. I would like to thank Dr. Roxana Turtorea for sharing her experience on developing online survey questionnaires with me and for reviewing the survey questionnaire of my research. Thank you Dr. Kevin Heij, Dr. Rick Hollen, and Dr. Renée Rotmans for helping me translating into Dutch an interview protocol and the survey questionnaire I used in my research.*

*PhD life can be a monotonic experience without a friendly social life at the office. I would like to thank my fellow PhDs, that made my experience colorful. Agnieska, Allina, Ata, Brian, Davide, Emre, Eric, Gizem, Hamed, Hamzeh, Henk, Illaria, Jane, Jitse, Joe, Jun, Jurrit, Krishnan, Lisanne, Lisanne, Maeyta, Mark, Masoud, Maura, Michael, Misagh, Mohammad, Nazanin, Omar, Pengfei, Plato, Pouria, Radina, Renée, Ron, Roxana, Saeedeh, Sai, Stefan, Thijs, and others from the ERIM for the happy moments we had together in our*

social events, e.g., the New Year celebrations, in de Smitse, and in the Erasmus Sport Center. Thank you, Dr. Behrang Manouchehrabadi for the insightful conversations we had over coffee breaks in which we covered topics in politics, economics, and science. It was a very timely and exciting experience to co-develop and co-teach a course with Lance, Somendra, and Tatjana. Together with Lance, while we were infusing 'the fresh air' at the M-Building entrance, we brainstormed for various projects. Thank you, Lance! I indeed enjoyed talking about the rich cultural heritage of our region with Somendra. Namaskar Dr. Somendra Narayan! Thank you, Dr. Tatjana Schneidmüller—my close friend with whom I discussed research ideas, proposal drafts, and exchanged reviews. We decompressed work pressure together by walking around campus Woudestein, drinking, and chatting about our PhD life and future careers. I would also like to thank the friends from outside my PhD track who offered me their intellectual support too: Amir Houshang, Mohammadreza, Negar, Pouria, Roozbeh, Shadi, Yasaman, and Yousef. I appreciate your friendship.

Close collaboration with the industry enriched my research. I am thankful for the collaboration and help I received from Manfred Dasselaar at Ericsson to collect data for Chapter 2 and Chapter 3 of this dissertation. I would like to thank Dr. Benny Borghei, Dr. Mohammadreza Saeedi, and Dr. Roozbeh Feiz Aghaei for their help and support in writing a proposal for research at Ericsson. Here, again, I appreciate Dr. Saeed Khanagha's supervision at Ericsson. Afterwards, I had the opportunity to participate in a research program of the Netherlands Organisation for Scientific Research with several industrial and academic partners. Through this program, I was granted permission and support to interview and collect data from the Port of Rotterdam Authority (POR), Randstad, and Alliander. I would like to appreciate these organizations' managers' collaboration, especially Henk de Bruijn from POR, Alje Kuiper from Randstad, and Bram Reinders from Alliander. I am also grateful for the program's academic partners for their contribution: Professor Dr. Eric Stam and Dr. Chen Fleisher from Utrecht University, Professor Dr. Aard Groen and Dagmar Ylva Hattenberg from the University of Groningen, and Professor Dr. Andries de Grip and Dr. Sanne van Wetten from Maastricht University.

In 2018, I started my next position as a postdoc at the Science-Based Business (SBB) center, Faculty of Science, Leiden University. There, I designed and taught my first courses for students of science with an interest in the business topics. I give my gratitude to

*Professor Dr. Simcha Jong, Dr. Jian Wang, Dr. Xishu Li, Lisa Fillekes, and Loes van den Hulst-Scheffer for the friendly working environment of the SBB that let me enjoy the process of research and teaching at the SBB.. In February 2020, I joined the Amsterdam Business School (ABS) at the University of Amsterdam as an assistant professor. I would like to offer my thanks to Professor Dr. Mark van der Veen and other colleagues at the ABS for their warm welcome and support. I would like to thank Iris Kroese for her administrative support before, during, and after my transition time to the ABS.*

*During this period, I attended several conferences and received invaluable comments on my research from academics. I appreciate all of them. I would like to express my thanks to Professor Dr. Peter Bryant and Professor Dr. David Sluss, my mentors at AOM conferences, for answering my career-related questions.*

*No words can describe how the heartwarming support of my lovely family boosted my motivation during the PhD period. I would like to extend my unparalleled gratitude to Aziz for her attention to me. Her prayers and kind words always reassured me. I would like to extend my special thanks to my brothers, my in-laws, and their families: Habib, Ali, Mohammad, Abdollah, Dadash Nosrat, Baba Mohammad, Maman Kolsoum, Maryam, and specially Mostafa for their support whenever it was needed. Finally, I am indebted to Somayeh: We have been partnering in wonderful adventures throughout the last 18 years. Full of love, she has been a kind, devoted, and hearty supporter. I cannot thank her enough for everything she has done and the contentment she keeps bringing to our lives.*

*Mohammad Taghi Ramezan Zadeh*

*Rotterdam*

*25 November 2020*

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# **Chapter 1: Introduction**



# **1 Introduction**

## **1.1 Overview: Adaptation to technological revolution**

The digital revolution influences industries one after the other and challenges incumbents' survival (Helfat and Raubitschek, 2018; van Knippenberg et al., 2015; de la Boutetière et al., 2018; Porter and Heppelmann, 2015; Teece, 2018). Exponential advancements in information storage, process, and communication technologies have led to the ease of application and pervasiveness of the technologies (Nambisan et al., 2017). As a consequence, entry barriers for industries are reduced for challengers. Digital advancements have also enabled industry convergence (Yoffie, 1997) and have proliferated new ways of creating and capturing value (Porter and Heppelmann, 2015; Teece, 2018). The technology revolution makes firms face the competing forces of change from different sides of the business value chain and ecosystem (Adner and Levinthal, 2001; Dattée et al., 2017; Moore, 1993). Change can threaten the firm as it tends to alter the core activities, business logic, and performance standards (Gawer and Phillips, 2013; Hamel and Prahalad, 1989; Helfat and Raubitschek, 2018; Nagarajan and Mitchell, 1998; Teece, 2018). New technology can also create a fertile ground for cultivating innovative ideas and a firm's renewal and growth (Sine and David, 2003; Tushman and Anderson, 1986).

When a technological paradigm shifts, as in the digital revolution, consecutive waves of divergent new technologies (Dosi, 1982, 1988) cause high uncertainty and ambiguity in the business environment (Aldrich and Fiol, 1994; Anderson and Tushman, 1990). Thus, a firm in such an environment tends to make its operations more efficient. However, this tendency is hazardous for its survival in turbulent environments, especially when the new technology requires new sets of core activities (Nagarajan and Mitchell, 1998). To adapt to turbulent environments, firms need to adjust their businesses swiftly and frequently to survive (Eisenhardt et al., 2010). However, there are barriers in front of the adaptation process. Researchers from different camps have identified cognitive inertia, resource rigidity, and process rigidity as the main impediments of adaptation (Christensen, 1997; Danneels, 2011; Gilbert, 2005; Leonard-Barton, 1992; Pfeffer and Salancik, 1978; Raffaelli et al., 2019; Tripsas, 2009; Tripsas and Gavetti, 2000; Winter, 2003). In this

dissertation, I present studies that disentangle the complicated relationship between resources, processes, and cognition required for incumbents' adaptation in the digital revolution era.

Managerial cognition is key to developing and deploying resources for adaptation (March and Simon, 1958) and growth (Penrose, 1959). How managers attend to and interpret changes in the environment, and how they perceive who they are and what they do as an organization, form how firms respond to change—see Eggers & Kaplan (2013) for an extensive literature review. However, managers diverge in their interpretations across hierarchical organizational levels, for instance, due to their relative distance from the core business actions and their business priorities (Gavetti, 2005). Therefore, managers' interaction across organizational hierarchy levels and functions matters in terms of how firms adapt to new technologies (Burgelman, 1983a; Floyd and Wooldridge, 1992). Burgelman (1991) theorizes how internal organizational ecology of autonomous strategy making works in parallel with its formal strategy process. Follow-up studies extend the theories of how top managers benefit from such a parallel strategizing process, i.e., top-down and bottom-up, intentionally (Kannan-Narasimhan and Lawrence, 2018; Lovas and Ghoshal, 2000). Notwithstanding, current studies rarely document how firms manage to break the co-evolutionary “lock-in effect” that prevents a successful strategy making for adaptation (Burgelman, 2002; Gavetti, 2012).

Organizational cognition is central to how firms adapt. Organizational cognitive processes, e.g., the memory of the collective experience (Weick and Sutcliffe, 2006), guide managers' decisions and actions (Kaplan, 2011; Ocasio, 1997; Walsh, 1995). For instance, firms' cognitive capabilities help them identify and exploit opportunities that are created by new technology (Cohen and Levinthal, 1994). (Gavetti and Menon, 2016)(Gavetti and Menon, 2016)(Gavetti and Menon, 2016)(Gavetti and Menon, 2016)(Gavetti and Menon, 2016)(Gavetti & Menon, 2016)(Gavetti & Menon, 2016)(Gavetti & Menon, 2016)(Gavetti & Menon, 2016)Organizational cognitive capabilities, e.g., absorptive capacity (Zahra and George, 2002) can boost managers' ability to adopt other firms' capabilities (Gavetti and Menon, 2016). Although research on how managerial cognition influences organizational capabilities is abundant

(Eggers and Kaplan, 2013), only a few studies have investigated the managerial cognition situatedness and its effects on organizational cognition and other firm-level outcomes in different organizational and institutional contexts (Ocasio, 1997). Specifically, how managers' agency breaks the path dependency and creates a new path for adaptation at a cognitive level is under-explored (Gavetti, 2012; Gavetti and Menon, 2016; Hutzschenreuter et al., 2007; Jacobides and Winter, 2012).

The problem of adapting to technological change is a challenging one for technology innovators and their customers alike (Khanagha et al., 2018). Scholars have dedicated their endeavors to studying the emergence of dominant design (Cennamo, 2018; Chen et al., 2017; Suarez, 2004) or how market players adopt the dominant design (Gerstner et al., 2013; Raffaelli et al., 2019; Taylor and Helfat, 2009; Xue et al., 2011). Technology development and adaptation may take a considerably long time. Yet, studies that address the adaptation to a technological change while it is emerging are lacking. Given the strategic relevance of technological innovation and the consequences of failure in adaptation to new major technology in the early stage of its emergence, I study managerial and organizational adaptive behavior in this less attended stage of technology life cycles (Anderson and Tushman, 1990; Suarez, 2004) in this dissertation.

I aim to fill in these theoretical and empirical gaps by developing, blending, and testing theories of strategy process and managerial and organizational cognition. In particular, I build this dissertation on the theories of adaptation (Helfat and Martin, 2015; Helfat and Peteraf, 2015; Raffaelli et al., 2019; Tripsas and Gavetti, 2000) to portray how an organization-wide adaptation and growth process (Burgelman, 2002; Gavetti, 2005) enables incumbents to navigate through the high levels of complexity imposed by both internal and demand heterogeneity (Adner, 2002; Adner and Levinthal, 2001; Burgelman and Grove, 2007; Dattée et al., 2017), uncertainty, and ambiguity (Eisenhardt et al., 2010; Navis and Glynn, 2010; Santos and Eisenhardt, 2009). In this dissertation, I report on the adaptation—platform technology development, platform technology adoption, and 'platformization' (Nambisan et al., 2018)—of large and established firms during the digital revolution (Helfat and Raubitschek, 2018; van Knippenberg et al., 2015; Porter and Heppelmann, 2015; Teece, 2018). I examine the role of managerial and organizational

cognition and cognitive actions—including the interpretation of the environment (Kor et al., 2007), attention to change (Ocasio, 1997), and organizational identity (Albert and Whetten, 1985) as well as the organizational ability to identify and apply new knowledge (Zahra and George, 2002)—in adaptation. The studies that are presented in this dissertation concentrate on the early stages of digital technology adoption in different industries.

To meet the purpose of this research, I collected and analyzed original qualitative and quantitative data through interviewing managers and other informants, focus group discussion, document review, and online questionnaire survey, and combined them with publicly available data. I applied qualitative and statistical methods to analyze data and draw conclusions. In the next section, I outline the dissertation by presenting the research questions, major findings, and the context of each study.

## **1.2 Research questions**

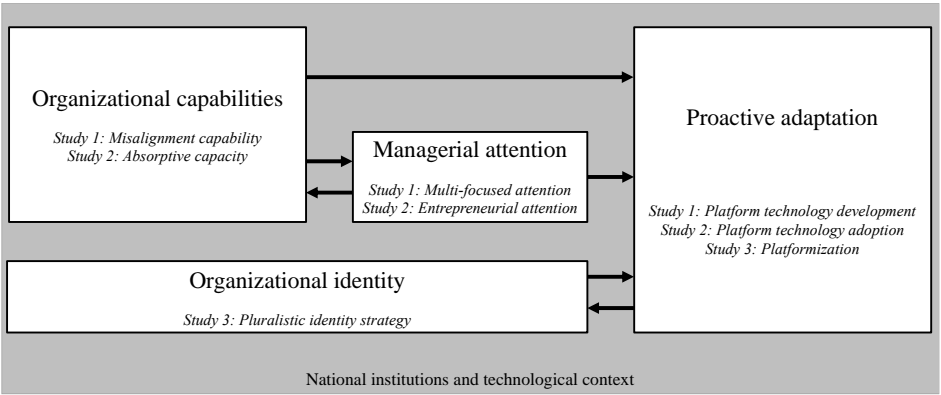
In this dissertation, I answer how the firm can proactively develop and adopt new digital technologies, given its cognitive limitations. I zoom in on the complex relationship between managerial and organizational capabilities and cognition: how organizational capabilities enable adaptation, what the role of managers' cognition in the adaptation process is, and how organizational change agents manage their cognitive frames as well as their cognitive activities to adapt their organization. In the next chapters, I answer the following research questions:

- I. What type of capabilities are required to simultaneously develop a revolutionary platform technology and deal with heterogeneous customer demands in an established global industry?
- II. What is the joint effect of macro (institutional) and micro (managerial and organizational) factors on adopting an emerging platform technology?
- III. How do managers overcome cognitive barriers rooted in an established organizational identity to adapt to the digital revolution proactively?

## **1.3 Basic conceptual model and summary of the studies**

Figure 1.1 illustrates the conceptual model of my dissertation and the three studies. The relationship between misalignment capability and the development of a platform technology (i.e., Cloud technology) is investigated in Study 1 (Chapter 2). How organizational absorptive capacity indirectly influences the firm’s adoption of new platform technology (i.e., Cloud technology) through turning managerial attention towards the technology is the topic of Study 2 (Chapter 3). How managers at different hierarchical levels of an organization turn organizational identity into a driving force for platformization is the subject of Study 3 (Chapter 4). In the last chapter of this dissertation (Chapter 5), I reflect on the main findings and describe the overall contributions and the managerial implications of the three studies. I also suggest avenues for future research in the last chapter.

**Figure 1.1– Overarching conceptual model of studies presented in this dissertation**



**1.3.1 What type of capabilities are required for simultaneously developing a revolutionary platform technology and dealing with heterogeneous customer demands in a global and established industry?**

Chapter 2 reports the study of the case of Ericsson, a multinational telecommunication technology provider, transitioning from product to platform business, driven by the development of Cloud technology. Employing an inductive method, we analyzed longitudinal qualitative data of the case and found that customers’ divergent demands and managers’ competing interpretations about the future of the technology and the market situate the firm in a complicated strategic context. In such a setting, Ericsson leverages its

misalignment capability—defined as the ability of the firm to accommodate a complex innovation process (experimentation, deployment, and ecosystem development) through contradictory and changing strategy, structure, and resource management—to address managers’ competing interpretations of the future. Misalignment capability is a second-order organizational ability utilized to consistently pursue inconsistent strategic directions, which we found and theorized about in Study 1. The findings of the study offer novel insights into how established firms adapt to technological change by devising a multi-focused response strategy. The study contributed to literature by theorizing about the transition of a product-based business to a software- and service-based business, taking into account diverging market forces. The study extends current theories of ambidexterity and vacillation to provide a more nuanced understanding of firms’ adaptive response: Cloud technology (as an architectural innovation) can also cannibalize the existing products and services of the firm. In doing so, the study explicates the boundary conditions of internal alignment as a conventional recommendation for adaptation. The study also added to the literature by featuring new dimensions of complexity in analyzing how multinationals maintain responsiveness in the global market and improve efficiency in the corporate headquarters in the early stage of technological change.

### **1.3.2 What is the joint effect of macro (institutional) and micro (managerial and organizational) factors on adopting an emerging platform technology?**

Chapter 3 presents Study 2 through which hypotheses are tested on how organizational and managerial cognition influence the adoption of new platform technology in different national contexts. From a microfoundational perspective, the study aims to provide a multi-level understanding of new platform technology adoption by examining a moderated mediation model. The baseline hypothesis is that managerial attention to a new platform technology mediates the relationship between organizational absorptive capacity and the adoption of new platform technology. The other hypotheses are on the role of country-level long-term orientation and regulatory system quality as boundary conditions of the mediation relationship. The study draws on the theory of absorptive capacity as a dynamic capability and attention-based view to analyze the effects of organization-, top management, and country-level factors on platform technology adoption. The main argument of the paper is

that absorptive capacity forms top managers' (entrepreneurial) expectations about the technology, thus contributing to their sustained attention on the new technology. Formal and informal institutions, i.e., regulatory systems (regulations quality, rule of law, and government efficiency) and long-term orientation, can influence the way absorptive capacity forms an individual's expectations; hence, there is a moderate relationship between organizational absorptive capacity and managerial attention. The findings support a significant role of management attention in technology adoption in countries with a short-term orientation. In other words, organizations in countries with a long-term orientation adopted new technology with an insignificant need for top managers' attention. We found a similar effect for regulatory systems. In countries that had weak regulatory systems, the influence of absorptive capacity on new platform technology adoption was effectuated through managerial attention to the technology. We analyzed a combination of the original data we collected on a representative sample of telecommunication operators with widely used macro-level data.

### **1.3.3 What is the joint effect of macro (institutional) and micro (managerial and organizational) factors on adopting an emerging platform technology?**

Chapter 3 presents Study 2 through which hypotheses are tested on how organizational and managerial cognition influence the adoption of new platform technology in different national contexts. From a microfoundational perspective, the study aims to provide a multi-level understanding of new platform technology adoption by examining a moderated mediation model. The baseline hypothesis is that managerial attention to a new platform technology mediates the relationship between organizational absorptive capacity and the adoption of new platform technology. The other hypotheses are on the role of country-level long-term orientation and regulatory system quality as boundary conditions of the mediation relationship. The study draws on the theory of absorptive capacity as a dynamic capability and attention-based view to analyze the effects of organization-, top management, and country-level factors on platform technology adoption. The main argument of the paper is that absorptive capacity forms top managers' (entrepreneurial) expectations about the technology, thus contributing to their sustained attention on the new technology. Formal and informal institutions, i.e., regulatory systems (regulations quality, rule of law, and

government efficiency) and long-term orientation, can influence the way absorptive capacity forms an individual's expectations; hence, there is a moderate relationship between organizational absorptive capacity and managerial attention. The findings support a significant role of management attention in technology adoption in countries with a short-term orientation. In other words, organizations in countries with a long-term orientation adopted new technology with an insignificant need for top managers' attention. We found a similar effect for regulatory systems. In countries that had weak regulatory systems, the influence of absorptive capacity on new platform technology adoption was effectuated through managerial attention to the technology. We analyzed a combination of the original data we collected on a representative sample of telecommunication operators with widely used macro-level data.

#### **1.3.4 How do managers overcome cognitive barriers rooted in an established organizational identity to adapt to the digital revolution proactively?**

Chapter 4 presents the study of three large, established Dutch firms to understand how managers from different levels think and act to advance the digital transformation of their organizations. In this study, the focus is on the cognitive barriers of transformation. Organizational identity forms managers' cognitive frames and consequently determines if and how they attend to opportunities in their environment. Organizational identity also motivates organizational members to take initiative and risks to enhance their organization's performance. The study provides insights into pluralistic identity strategies and their usefulness for adaptation. The multiplicity of sub-identities, which is rooted in functional and hierarchical segmentation, and different narratives of organizational identity, is a theoretical base of this study. Top managers provide cognitive freedom to middle and line managers to explore by communicating a meta-identity, i.e., an abstract reading of the existing identity that underscores the multipotent capabilities of the organization. The meta-identity is also in line with a vision of the desirable future, i.e., the image of the organization after adopting new digital technologies. In light of this cognitive freedom, entrepreneurial middle and line managers construct a sub-identity bricolage by combining existing sub-identities and desired identities. The desired identities are borrowed from challengers and entrepreneurial firms that are thought to become the reference points of the firm performance

in the digital era. It is less problematic to champion the adaptive projects with such sub-identity formation to key resources holders as the components of the bricolage are native to the organization or its meta-identity. As long as the sub-identity—in its work-in-progress state—remains within the boundaries of a meta-identity, it's associated adaptive project could garner organizational support based on its feasibility. The new sub-identity could also help top managers to clarify the meta-identity and play as a role model of a desirable future for the firm. In this process, managers of different hierarchical levels devise different strategies to maintain the stability of the organizational identity while aiming for a change in the core aspect of the business.

In Table 1.1, a summary of the key elements of the three studies is presented.

#### **1.4 Declaration of contributions and acknowledgment**

I would like to express my gratitude to my brilliant and knowledgeable coauthors with whom I had the opportunity to write the studies presented in this dissertation. By acknowledging their contributions, I am declaring my role in the last versions of the three studies, which I included in this dissertation. In **Study 1**, I actively took part in finding the research gap, collecting data, and writing up the paper. I specifically wrote a part of the theoretical background, most of the data and methods, and the analysis sections of the study. Dr. Saeed Khanagha, the lead author of the study, and I developed the theoretical model of the study benefitting from the other coauthors' comments, namely Dr. Oli Mihalache and Prof. Dr. Henk W. Volberda. I incorporated the other coauthors' comments into my writings. The study is published in volume 55, issue 7 of the *Journal of Management Studies*.

In **Study 2**, for which I am the lead author, Dr. Saeed Khanagha and I cooperated closely to find the research gap and collect data. I performed data analysis and wrote the text of the study. Likewise, I implemented my coauthors' comments, namely Dr. Saeed Khanagha, Dr. Oli Mihalache, and Prof. Dr. Henk W. Volberda. All coauthors worked together to develop the theoretical framework of the study.

For the first two studies, we used original data we collected from the headquarters of Ericsson AB, Kista, Sweden. This opportunity was granted to me as a researcher through a temporary employment contract with Ericsson in 2014.

In **Study 3**, as the lead author, I found the research gap, designed the research, collected and analyzed data, developed the model, and wrote the text. I benefitted largely from Prof. Dr. Henk W. Volberda's advice and comments on collecting data and developing the study. I obtained permission to collect and analyze the data of **Study 3** and present the work through participating in the research consortium of a project, namely "Intrapreneurship: Enabling talent for innovation." My Ph.D. position was partially funded through this project by the Netherlands Organization for Scientific Research (NWO) under project number: 409.13.210.

**Table 1.1– Key elements of the studies presented in the dissertation**

	Key concepts	Theoretical framework	Empirical setting	Data and method	Main findings
Study 1 (Chapter 2)	Demand heterogeneity; Technological uncertainty; Business ambiguity; Organizational capabilities; Adaptation to technological change	Resource-dependence; Organizational and managerial capabilities; Paradox;	Development and adoption of Cloud technology (platform technology) by telecommunication manufacturer	Longitudinal qualitative data; Single case study; Grounded theory and the result are corroborated by quantitative data from an online survey.	Ericsson managed to develop a new revolutionary technology that had the potential to cannibalize its current values and deal with customers’ divergent demands, although its financial performance declined. Misalignment capability and a complex innovation strategy enabled Ericsson to transform into a Cloud technology (platform) provider.
Study 2 (Chapter 3)	Organizational absorptive capacity, Managerial attention, Nations’ temporal orientation, Regulatory system quality, Platform technology adoption	Attention-based view; Organizational capabilities	Global adoption of Cloud technology; Telecommunication operators worldwide	Online survey data from 79 countries; Archival data on countries’ cultures and governments; Complementary interviews with the operations managers; Moderated mediation analysis	Confirmed mediation model; A significant effect for top management (organizational) agency, through their sustained attention, in poor (strong) institutional settings is confirmed.
Study 3 (Chapter 4)	Organizational identity, Cognitive inertia, Intrapreneurship, Adaptation to technological change	Social Identity theory and Identity-Innovation framework	Transforming to a platform-based business; Public and private service providers	Interview, document review, focus group data; Embedded multiple case study; Grounded theory and results are corroborated by analyzing quantitative data from an online survey.	Established organizations adapt to technological change by taking four steps: reflecting on and flexing, pluralizing, leveraging, and extending organizational identity. This occurs through promoting a pluralistic identity and an abstract meta-identity and constructing a sub-identity bricolage.



## Chapter 2: Embracing bewilderment

### Responding to technological disruption in heterogeneous market environments<sup>1</sup>

**Abstract.** In an age of rapid advances in technology, understanding how firms can respond to emergence of disruptive technologies is paramount for survival. While prior research on incumbents' responses to disruptive technologies assumes demand homogeneity, many firms, including multinational enterprises (MNEs), need to respond to technological disruption in heterogeneous markets. To address this lacuna in our understanding, we study how Ericsson tried to respond to the emergence of Cloud computing, a digital platform technology, across its operations in more than 170 countries. We reveal how incumbents need to match diverging customer demands with a complex innovation process, involving different approaches to experiments and trials, deployment strategy, and ecosystem development. We also find that the success of incumbents' responses depends on their capability for misalignment, which allows them to manage the inconsistencies in strategic direction, structure, and resource configuration associated with a complex innovation process.

**Keywords:** *Technological disruption, multinational enterprises, heterogeneous markets, strategic contradictions, misalignment capability*

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<sup>1</sup> . This chapter is published in volume 55, issue 7 of the Journal of Management Studies with the reference: Khanagha S, Ramezan Zadeh MT, Mihalache OR, Volberda HW. 2018. Embracing Bewilderment: Responding to Technological Disruption in Heterogeneous Market Environments. *Journal of Management Studies*. Wiley/Blackwell 55(7): 1079–1121.



## **2 Embracing bewilderment: Responding to technological disruption in heterogeneous market environments**

*“Sell your cleverness and buy bewilderment.” - Jalaluddin Rumi (1207–1273)*

### **2.1 Introduction**

In an age of rapid technological advances, the survival of firms often rests on their ability to deal with disruption in the environment. As new technologies challenge existing industry logics, firms need to adopt new ways of doing business to remain relevant. Mirroring this trend, there has also been a growth in recent years of management research on the challenges firms face during times of disruption (Cohen and Levinthal, 1990; Hannan and Freeman, 1984; Nelson and Winter, 1982) and on how firms can respond to disruption (Ansari et al., 2016; Ansari and Krop, 2012; Tripsas and Gavetti, 2000).

The conventional line of thought holds that as major technological change has a fundamental effect on many aspects of organizations (Taylor and Helfat, 2009) and their business models (Markides, 2006; Markides and Oyon, 2010), a coordinated adaptation that maintains strategic alignment between organizational assets and elements is recommended in order to achieve a sustainable competitive advantage (Birkinshaw et al., 2016; Helfat and Peteraf, 2015; Zajac et al., 2000). That is, drawing on contingency theory, existing research argues for the importance of internal fit, i.e., the alignment between internal aspects of the organization such as strategy, structure, and organizational activities (Peteraf and Reed, 2007).

However, despite the pervasiveness of this recommendation, many firms are unsuccessful in responding to disruption (Christensen et al., 2015; Fuentelsaz et al., 2015; King and Baatartogtokh, 2015; Uzunca, 2017) raising the question of the validity, feasibility, or boundaries of such an internal fit perspective. The universality of the strategic alignment perspective has recently been challenged by the idea that consistency can become less viable when firms face diverse contingencies and conflicting requirements (Le Breton-Miller and Miller, 2015; Poulis and Poulis, 2016; Smith, 2014). In this opposing perspective, it is argued that organizations are able to thrive by embracing misalignment between internal

components (Gulati and Puranam, 2009) and promoting inconsistent mentalities and structures (Smith et al., 2016).

In an effort to understand how firms can cope with disruption in their industries, we study how Ericsson, a leading global provider of telecommunications infrastructure with operations in more than 170 countries, is attempting to respond to technological disruption in its industry. The emergence of Cloud computing and its underlying technologies is challenging Ericsson's existing value logic by shifting value in the industry from the sale of hardware to the provision of Cloud-enabled services. This threatens Ericsson's standing in the industry as its key capabilities are designing and selling telecommunication equipment. We study Ericsson's adoption of a disruptive technology using an inductive approach involving analysis of chiefly qualitative data from multiple sources (i.e., internal documents and communications, 33 interviews with managers at different hierarchical levels, written comments from 170 relationship managers worldwide, and insights and observations from a five-year field study between 2010 and 2014).

We contribute to the discussion on how incumbents respond to technological disruption in several ways. First, our study contributes to disruption research by uncovering strategic tensions that arise from market heterogeneity when firms attempt to respond to industry disruption. We complement prior research that has generally considered incumbents' responses to disruption in homogenous markets for the new technology (e.g., Gilbert, 2005; Taylor and Helfat, 2009). The incorporation of demand-side heterogeneity in our study allows us to study the subsequent strains on an incumbent's attempts to form a shared interpretation of the future. This is in line with the growing attention being given to multi-sided markets and platform ecosystems by strategy and organization scholars who consider heterogeneity an important, yet less examined, factor that influences the strategic behavior of suppliers (e.g., McIntyre & Srinivasan, 2017; Rietveld & Eggers, 2018)). Our findings highlight how firms facing high levels of market heterogeneity need to understand and accommodate the presence of tensions between different interpretations of the future in terms of the magnitude and speed of changes in the market.

Second, we add to the recent debates over whether internal alignment has a universal value as a lever for effective strategic change (Le Breton-Miller and Miller, 2015; Poulis and Poulis, 2016; Smith et al., 2016). In particular, we propose market heterogeneity as a potential a boundary condition for whether focusing on internal fit may constitute an effective response to disruption. We therefore prepare the ground for discussing the organizational capabilities that allow an incumbent to appreciate, nurture, and deal with the tensions of misalignment – capabilities that could be argued to be crucial for the firm’s survival.

Third, we contribute to research on international business by providing grounded theory on how MNEs respond to disruption. We advance previous research which acknowledges that MNEs often have to deal with a far greater number of contingencies and a higher degree of market heterogeneity compared to other organizations (Teece, 2014) in that we show how this type of complexity affects MNEs’ responses to disruption. We also complement research on how MNEs can deal effectively with demand heterogeneity in relatively stable conditions by considering their need for responsiveness and efficiency (Ghoshal and Nohria, 1989, 1993; Nohria and Ghoshal, 1994, 1997).

## **2.2 Theoretical motivation**

### **2.2.1 Organizational alignment, misalignment, and strategic change**

The strategic management literature lays considerable stress on the importance of alignment and realignment between strategy, structure, people, and culture for the long-term survival and competitiveness of firms (Tushman and O’Reilly, 1996). Fit between organizational elements is said to enhance performance because it provides employees with clear direction about appropriate actions and behavior, it aligns different organizational elements so that they reinforce one another, and it helps to maintain a coherent image of the organization both internally and externally (Miller, 1992; Nadler et al., 1997; Porter, 1996; Soda and Zaheer, 2012). When there is major change, the success of an organization is dependent on ensuring that plans and decisions are in alignment and that the actions undertaken are consistent (Stettner and Lavie, 2014; Taylor and Helfat, 2009); the effectiveness of specific organizational change efforts and strategies depends on the degree to which they are aligned

with other elements of the organization (Helfat and Peteraf, 2015; Whittington et al., 1999). In other words, the ability to achieve internal fit as conditions change is a key managerial capability required for organizational change. Further advancing the contingency view, Donaldson (2001) developed the concept of quasi fit to address the issue that permanent disequilibrium requires a constant search for strategic and structural change and therefore perfect fit becomes of less relevance. Neo-contingency theorists conceptualize, and provide empirical support for, the benefits of ‘dynamic fit’ – that is, continuous alignment and realignment with internal resource profiles and with external environmental factors – when dealing with organizational change efforts (Zajac, Kraatz, and Bresser, 2000). The modern contingency view maintains that high performance is a consequence of co-alignment between a limited number of organizational and environmental factors (Volberda et al., 2012). From a configurational perspective, Birkinshaw, Zimmermann, and Raisch (2016) contend that any of the alternative strategies for responding to discontinuous change are effective only if they are in harmony with the constellation of an organization’s vision, culture, and people development model. Other researchers argue for the importance of ‘fit’ by drawing on the complementary theory that contends that “doing more of one thing increases the returns to doing more of another” (Milgrom and Roberts, 1995, p. 181) and that changes in one activity may affect the benefits accruing from other activities. From this perspective, firms must find the best fit between various types of activity in order to achieve better performance (Huesch, 2013).

In spite of the pervasiveness of the ‘fit’ perspective and the intuitive benefits of organizational alignment in the face of change, there is emerging theoretical argumentation and empirical evidence to suggest that alignment may not always be either beneficial or applicable. As the desired functionality may sometimes lie in-between the steady-state functionality delivered by two discrete choices, such as two organizational forms, going for what appears to offer the best ‘fit’ choice may prove unproductive (Nickerson and Zenger, 2002). Instead, organizations may focus on modulating between alternative choices over time in order to enjoy the advantages of both. This is feasible because when the formal organization changes, the informal organization remains intact for a while, and the subsequent misalignment between the formal and informal organization allow the benefits of both options to be enjoyed concurrently (Boumgarden et al., 2012; Gulati and Puranam,

2009). Also, when the value of a resource is dependent on the context in which it is employed, a change in context may then take away the advantages of that resource (Priem and Butler, 2001), and an attempt to adapt one part of the system to a changing competitive landscape might destroy its fit with other parts of the system (Le Breton-Miller and Miller, 2015). This creates a conflict between the internal fit required for a smoothly functioning system and the external fit to a changing environment (D. Miller, 1993).

Such discussions bring into question the usefulness of internal fit as a universal solution for responding to disruption, particularly for organizations that have to balance many different factors. While these few studies might provide the initial ground for challenging conventional thinking, we are a long way from understanding the boundaries of internal fit, the mechanisms through which these boundaries work, or what the alternative solutions might be. Since large incumbents appear to face the most challenges in terms of dealing with disruption and have a greater number of factors to consider in how they respond to disruption, we set out to explore how large MNEs adapt to drastic technological change in their industry.

### **2.2.2 How MNEs respond to disruption**

As MNEs operate in several different institutional, cultural, and economic contexts (Doz et al., 1981), the environment they have to work within when responding to disruption is highly complex. They have to deal with competing forces, some of which require local responsiveness from subsidiaries and others global integration under the umbrella of the MNE's overall structure (Ghoshal and Nohria, 1989; Nohria and Ghoshal, 1994, 1997), and reconciling these conflicting forces often proves to be a serious challenge for headquarters (Meyer et al., 2011).

So far research has considered only how headquarters influence the adoption of new strategies within individual subsidiaries, overlooking how MNEs can take orchestrated action to respond to disruption. We know that subsidiary characteristics affect the absorption of information from headquarters (Markóczy, 2000; Schleimer and Pedersen, 2013) and that managing nested hierarchical relationships across multiple organizational layers, and coordinating these relationships across diverse subunits embedded in different social

contexts, can overcome such challenges (Hoenen and Kostova, 2015). Despite the importance of dealing with disruption for a firm's survival, there is a lack of research on how MNEs can respond to technological disruption. There are several reasons why responding to industry disruption is more challenging for MNEs than other organizations.

First of all, MNEs serve a multitude of customers who have different expectations of the MNE, given that they are embedded in different environments. This is a key challenge for MNEs as we know that, due to resource dependency, their response can be affected by customers' perceptions of the importance of disruption. Resource dependence theory suggests that a firm's external resource providers, including customers, shape and constrain its internal strategic choices (Pfeffer and Salancik, 1978). For instance, Gilbert (2005) finds that publishers' decisions on whether to take their newspapers online were influenced by the interest shown by advertisers in the new medium. This is understandable since a mismatch between a new offering and customer needs may prove to be extremely costly for the provider company (Hargadon and Douglas, 2001). However, prior research has not given sufficient consideration to the possibility of differential responses from customers, nor has it provided any real clarity on the consequences of different responses from independent units of the organization. Indeed, customers may differ in their willingness and ability to change, due to the particular characteristics of their company or the context in which they operate (Rogers, 2002; Xue et al., 2011) and this can have serious implications for an incumbent that is dependent on its customers (Priem et al., 2012). Moving to a new technology early on can be costly and can mean lost revenues since lead customers tend to be smaller in size and business volume than laggards (Christensen, 1997). Also, exploratory activities may backfire, taking the firm in a direction that is at odds with its existing business model and causing it to fall behind its competitors, thus undermining its position. Conversely, customers who perceive the new technology to be truly disruptive might demand new solutions early on, as they might see this technology as being central to their own survival. As von Hippel (1988) contended, lead customers expect their supplier to demonstrate leadership and active participation in radical change processes. In addition to providing resources to the incumbent, these early users can actually contribute to the development of the new competencies and solutions (Lettl et al., 2006). Prior research on resource dependence suggests that heterogeneity creates challenges in terms of controlling

the dependencies (Aharoni et al., 1981; Hillman et al., 2009). The discussion above also suggests that customer heterogeneity increases the challenges for incumbents in responding to disruption since it makes it more difficult for them to anticipate future demand.

Second, MNEs face particular difficulties in responding to disruption because foreign subsidiaries can also influence strategic behavior at MNE headquarters (Andersson et al., 2007; Andersson and Pahlberg, 1997; Bouquet and Birkinshaw, 2011). Research advocates that, in order to understand the needs of different customer groups and how to address them profitably (e.g., Hamel and Prahalad, 1989; Teece, 2007, 2010), MNEs should maintain an outside-in focus (McGrath, 2010) and foreign subsidiaries should act as sensing mechanisms about the market. The problem is that, because of market heterogeneity, mixed messages about customer expectations are likely to be received at MNE headquarters. While we know how MNEs can manage the trade-off between maximizing revenues by adapting to customer heterogeneity or minimizing costs through standardization (Bartlett and Ghoshal, 1988), we do not know how they might manage such demand heterogeneity when responding to disruption. In the case of technological disruption, the trade-off is much more complex and dramatic than the trade-off between local adaptation and standardization: here MNEs face much stronger tensions between their established business with its prevailing logic, structure, and culture, and a different business which involves new ways of creating and capturing value.

These tensions, stemming from the heterogeneity of MNEs' markets, create an inordinate number of contingencies that complicate MNEs' strategic management and the capabilities required for adaptation (Teece, 2014). While we know that customer expectations are important for incumbents' strategic decisions and behavior, we do not know the mechanisms by which demand heterogeneity affects these firms' responses to disruption. With this study, we therefore attempt to learn more about the challenges that demand heterogeneity poses for MNEs facing disruption and how they might begin to overcome them.

## **2.3 Research context and methods**

Our research context is the mobile telecommunication industry, and we chose Ericsson because the company is dealing with a new technology with major disruptive implications and extreme heterogeneity in the market. This particular industry has traditionally been populated by a few infrastructure providers that enable mobile service providers (mobile operators) in different countries and regions to provide telecommunications services to individuals and enterprises. For many years, technological developments were mostly gradual and incremental in nature: increases in bandwidth and speed of telecommunication and the introduction of multimedia services based on these advances. It was only recently that the industry experienced the so-called ‘digital disruption’, in which Cloud computing is a key force (Ahmadi, Khanagha, Berchicci, Jansen, 2017; Alexiou, Khanagha, and Schippers, 2018; Haug, Kretschmer, and Strobel, 2016). The Cloud is expected to put an end to many of the existing business models and technologies in the telecommunication sector. This context therefore provides a fertile ground for empirical investigation of technological disruption, and we selected Ericsson as one of the leading MNEs affected by this emergent disruption.

### **2.3.1 Data collection**

The focus of this study is theory-building and we therefore apply an inductive approach. Our focus is on extracting insights from the qualitative data, from interviews and other textual data. As detailed below, we started by building a case archive and conducting exploratory interviews. We then investigated company documents which gave us a longitudinal perspective on the process of technology adoption. We subsequently undertook additional interviews, conducted a survey, and amassed a substantial collection of secondary data from various sources.

We employed four main sources of data to study the antecedents, contents, and outcomes of the Ericsson strategy in relation to Cloud technology: (1) interviews with senior managers who had been involved in Cloud technology adoption at Ericsson, plus our own notes from internal briefing sessions on Ericsson’s strategy from 2009 to 2016. The interviews focused on the key research questions presented in this paper, and each was semi-

structured, using a questionnaire with a set of prompts. Interviews typically lasted between 60 and 90 minutes; (2) Ericsson's internal archives, including strategy meeting presentation slides and notes, an online forum, involving more than 1000 managers, where managers discuss Ericsson's strategies, etc.; and (3) published reports, commentaries, and articles on the ICT industry, and analyses that were specific to Ericsson. In Table 2.1 we present details of the data sources and how these were used in our analysis.

### **2.3.2 Data analysis**

We applied a longitudinal case study approach to build a grounded theoretical model of how the incumbents respond to technological disruption when there are heterogeneous customer demands. We used content analysis techniques to make sense of the data from our various sources. Starting from an analysis of the data, we developed a preliminary abstract theoretical model.

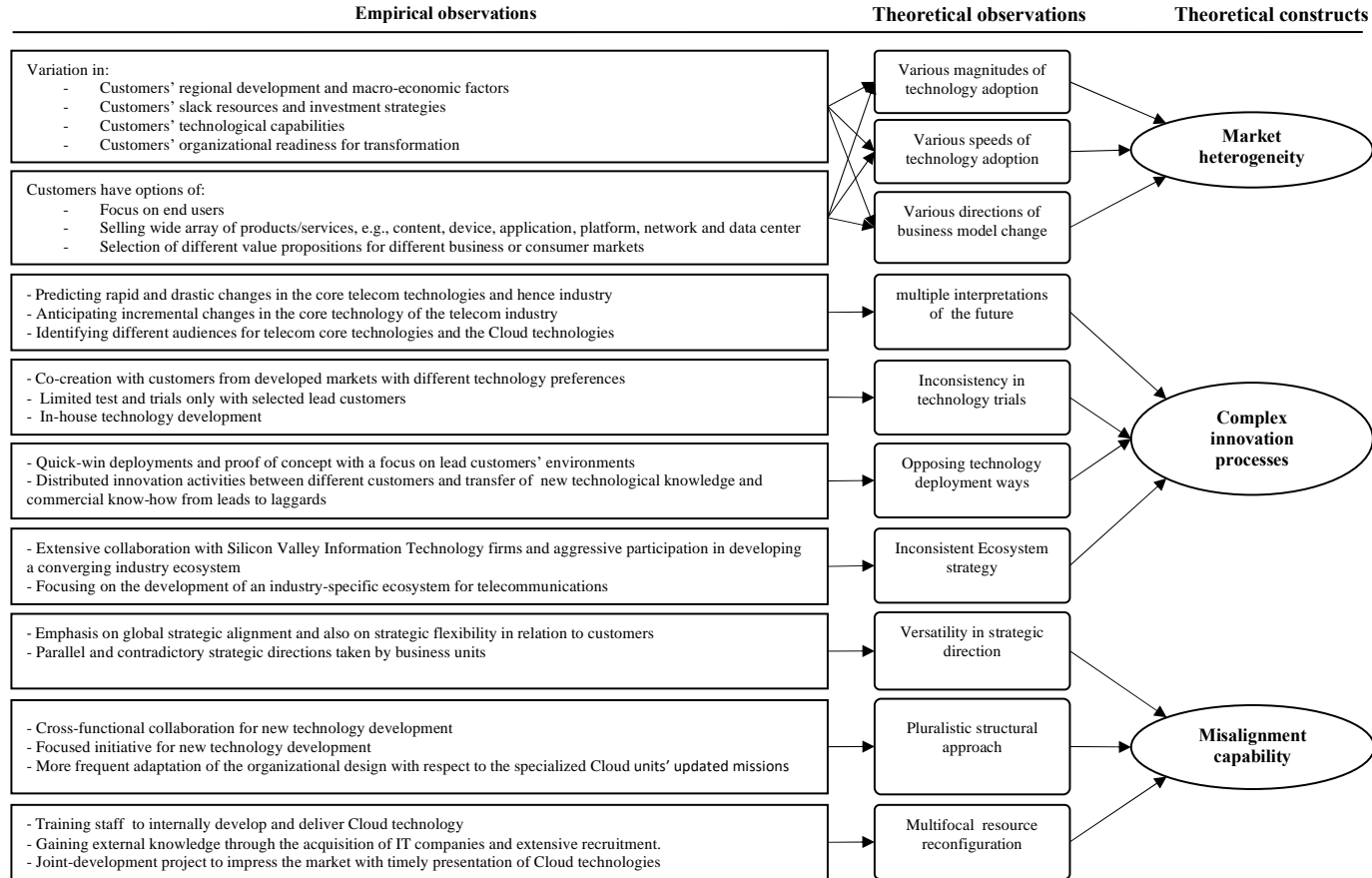
To ensure a high level of credibility, consistency, and transferability, we followed established methods: (i) long-time engagement with the field to ensure sufficient involvement with the context and data (Lincoln and Guba, 1985); (ii) both retrospective and real-time data collection (Eisenhardt and Graebner, 2007) from several different sources of data for triangulation (Eisenhardt, 1989); and (iii) thick description, and informant as well as outsider feedback to increase the validity of our interpretations (Langley, 2007; Lincoln and Guba, 1985). We now outline in detail the procedure used for the qualitative data analysis, where the research process was recursive and included feedback loops between each step.

***Step 1: Drawing a timeline of events.*** We searched Ericsson's intranet to extract any documents relating to Cloud computing issued during the period from 2008 (three years before our data collection began) to 2014. We also asked relevant managers to share with us strategy material and documentation relating to specific projects and initiatives. Additionally, we secured access to a strategic management online forum in which around 1,000 of the company's strategy managers and professionals present and debate key strategic issues. Cloud computing has been one of the top items for discussion for quite some time. This process enabled us to identify the sequence of key events which could then be used as a basis for further analysis of the events.

**Table 2.1– Data sources**

<b>Data sources</b>	<b>Details</b>	<b>Purpose</b>
Interviews and memos	<ul style="list-style-type: none"> <li>- The transcripts (almost 700 pages) of interviews with 33 managers involved in Ericsson's Cloud technology initiatives from 2009 to 2016, conducted in the company's headquarters or over the phone with managers working in the account offices. Includes follow-up interviews (350 pages).</li> <li>- 105 pages of notes from attending management presentation sessions on Cloud strategy.</li> </ul>	<ul style="list-style-type: none"> <li>- Identify managers' opinions on how Ericsson is responding to Cloud technology in terms of strategy and structure; track the changes of Ericsson's strategy germane to the Cloud both historically and as it unfolds and evolves; identify and refine theoretical themes.</li> <li>- Identify official plans and the history/progress of plans for the adoption of Cloud technology; understand topical discussions within the organization on Ericsson's Cloud-related strategies; verify data from observations and facts based on the content of presentations and discussions as Cloud-related strategy unfolds.</li> </ul>
Internal archives	<ul style="list-style-type: none"> <li>- Ericsson's managers' comments in an internal online strategy forum from 2009–2014.</li> <li>- Presentation files (40 files, with almost 1600 slides), video recordings of Ericsson's senior managers' interviews and lectures, and video recordings of internal meetings on Cloud technology (20 videos, containing around 100 minutes of recording).</li> </ul>	<ul style="list-style-type: none"> <li>- Acquire a fine-grained understanding of Ericsson's strategy in terms of Cloud technology as it unfolds; understand the strategic concerns of different departments.</li> </ul>
Survey	<ul style="list-style-type: none"> <li>- 138 managers' answers to open questions from 114 Ericsson's accounts worldwide in November and December 2014.</li> <li>- Secondary data collection relating to Ericsson customers worldwide in terms of their regional development, based on OECD categorizations of countries' economic development.</li> </ul>	<ul style="list-style-type: none"> <li>- Identify the expectations of Ericsson's customers regarding the required changes in technology and the change in Ericsson's business model; gather data on the customers' progress in adopting Cloud technology.</li> <li>- Acquire macroeconomic data on customers' regional development.</li> </ul>
Published reports, articles, and commentaries	<ul style="list-style-type: none"> <li>- Ericsson's annual reports from 2009 to 2016; Ericsson's publicly available histories of key events associated with Cloud technology, including managers' appearances in the media.</li> <li>- Telecom industry reports and analyst reports specific to Ericsson (around 400 pages) on the consequences of the emergence of Cloud technology and on convergence in the IT and telecom industry (BCG, TBR, Data Monitor, Marketline, Gartner, and the Telecommunication Industry Association) accessed from EBSCO databases and via Google searches; scholarly publications on Ericsson's Cloud-related initiatives.</li> </ul>	<ul style="list-style-type: none"> <li>- Gather complementary facts on the strategy and structure of Ericsson as its Cloud strategy unfolds.</li> <li>- Gain additional understanding of the context and secure an outsider view of the evolution of Ericsson strategy with regard to Cloud technology; triangulate observations and facts.</li> </ul>

**Figure 2.1– Data structure**



**Step 2: Understanding the responses of MNEs and theory-building.** Drawing on our data, we conducted formal interviews with 33 individuals, including managers from different business units, technology experts, and regional managers representing 13 global regions in order to contextualize the data previously acquired. Given that our focus was on a global market, interviews with managers at the company's headquarters as well as in its various subsidiaries were essential to address the research questions of this study.

To analyze the interview transcripts and other available data we used open, axial, and selective coding procedures (Strauss and Corbin, 2008). First, we used open coding to identify and group relevant concepts into categories. Then, we used axial coding to investigate the connections between the existing categories. We continued the analysis and allowed codes to emerge until we had a clear understanding of the relationship between different categories. The findings are based on repeated observation of a particular category in different interviews and the other data sources.

To this end, two of the authors began by identifying an initial set of salient concepts, particularly those relating to issues around technology disruption in different regions and tried to identify patterns of similarity and difference. In addition to analyzing the interview data, we did extensive analysis of archival data, field memos, and publicly available data on Ericsson's Cloud technology programs. This allowed us to investigate the conditions that gave rise to the phenomena under study, and to explore the connections between emerging concepts in our theoretical model. However, as there are limits to the causal interpretations we can make from the qualitative data, we found it useful to combine those data with quantitative data during the later stages of data collection and analysis. By using quantitative data and analysis, we went beyond a merely qualitative inquiry, enriching and expanding our analysis and ensuring the robustness of our findings (Creswell, 2009; Tunarosa and Glynn, 2016).

**Step 3: Additional data collection to delineate the theory.** Since our data collection and analysis were progressing in parallel, we were able to dig deep into our various sources of data and to ask interviewees questions that allowed us to corroborate or refine our coding. This approach was useful for zooming in on the dimensions of our theoretical model on the basis of more focused data collection and analyses.

We concluded by validating core concepts and relating them systematically to each other to form our data structure (Gioia, Corley, et al., 2012; Saini and Shlonsky, 2012). We used the memos and observations of one of the authors who had been researching Ericsson for more than five years. Furthermore, after any iteration or update two of the authors who

had collected the data would cross-check their understandings, exploratory findings, and themes with respect to the research question and the theoretical lens being applied. These two authors would then present their new agreed understanding to the other two authors, who took on the role of ‘outsiders’ questioning their understanding. In parallel, one of the authors, a senior researcher at Ericsson, presented the exploratory findings of this research to Ericsson managers dealing with the adoption of Cloud technology, in several focus group sessions. In this way, we were able to obtain and incorporate their comments to rectify and validate our interpretations of events, processes, and themes emerging in Ericsson’s adoption of this technology. We devised these various means of refining our analytical schemes after first discussing within the research team the potential discrepancies in understanding between researchers and practitioners (Evered and Louis, 1981; Miles and Huberman, 1994).

Figure 2.1 illustrates a structure that contains the core concepts we found in our data. We categorized the relevant pieces of raw data – for instance, interview excerpts, quotations, or notes – as first-order concepts. The content of the second-order categories was built based on the first category and was informed by existing theoretical views. We drew on the second-order categories to develop our theoretical model of the relationship between the antecedents of market heterogeneity in response to disruptive innovation and the consequences of this heterogeneity for MNEs.

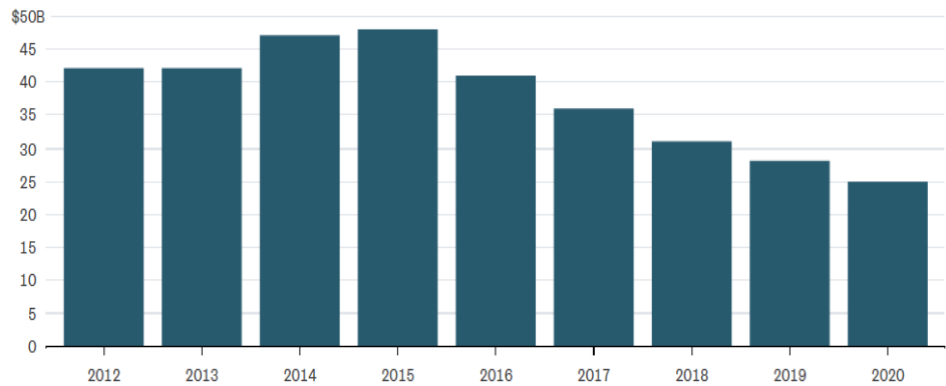
## **2.4 Responding to disruption in heterogeneous markets**

Ericsson is a global provider of networking and telecommunications equipment and services, and after divesting its cellphone production unit in 2013, it now focuses solely on the business-to-business telecommunication market.

The company was founded in 1876 in a small mechanical workshop and has grown to become a key player in communications technologies over the past 150 years. In 2012, Ericsson had around 35% percent of the global market and was the leading telecommunications company in terms of revenues. Since then, however, this position has been seriously challenged; in 2016, a Chinese competitor overtook Ericsson in revenues for the first time and Ericsson experienced a net loss after years of profitability. Although this

worrying decline in performance became most apparent around 2015, the trend can be seen further back in history, and Ericsson’s key competitors have experienced similar problems (Figure 2.2).

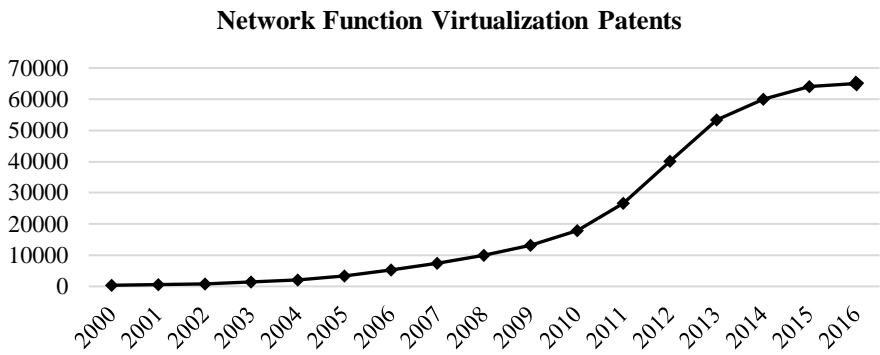
**Figure 2.2– Forecasts for telecommunication infrastructure revenue, 2016–2020**  
(Source: [www.bloomberg.com](http://www.bloomberg.com))



Ericsson’s rapid growth in the past was due to its technical superiority and its capacity to sell reliable, high-quality equipment to major customers around the world. However, recent changes in the firm’s environment have put Ericsson’s success formula under threat. One main issue is that technological advances have meant that hardware products are becoming less and less valuable, and it is now virtually impossible for Ericsson to outcompete low-cost competitors on price. In fact, Ericsson’s customers are now less willing to invest in new hardware technologies, especially now that alternative solutions are emerging because of rapid technological changes. Traditionally, launching a new network service has often required large amounts of physical space to accommodate new products, and this is compounded by increasing energy costs, the need for substantial capital investment, and a shortage of skills in designing, integrating, and operating increasingly complex hardware-based appliances. Hardware appliances have a very short life cycle, requiring much of the procure-design-integrate-deploy cycle to be repeated with little or no revenue benefit. Even worse, hardware life cycles are now becoming even shorter as technology and services innovation accelerates, inhibiting the roll-out of new revenue-earning network services and constraining innovation in a world that is increasingly

network-centric. The advent of Cloud computing technologies provides a new way of avoiding such costs and difficulties, even though it comes at the cost of disrupting Ericsson’s core business.

**Figure 2.3– An indication of the growth of Cloud computing technologies**



While the Cloud appears to Ericsson’s customers to be a sustainable innovation because it allows them to provide more and better services, exploiting this technology to the full is disruptive for Ericsson’s core technology and business model. First, Cloud makes it possible for many new entrants from the IT sector, both large and small, to provide services to operators. As the Cloud is open and no specialized hardware is required, many IT companies, including small software developers with only a handful of engineers, will effectively be able to provide Cloud-based functionality that is commensurate with what Ericsson delivers, with thousands of engineers. In the initial stages, Cloud solutions for mobile operators were fairly basic and less attractive to potential users, because of issues such as security and performance. However, when their full potential is realized, Cloud solutions are expected to upend existing markets and create a fertile ground for new entrants to take away the business of incumbents such as Ericsson. As shown in Figure 2.3, the main underlying technologies have been under development since the early years of the twenty-first century, and the technology became relatively mature and ready for commercial use around 2014. Despite the availability of the technologies, adoption by providers of network services was delayed for a variety of reasons. Our focus in the qualitative data collection

was on investigating the strategic aspects of the adoption of Cloud computing technologies by looking at key players in the telecommunication sector.

As a truly global organization, Ericsson follows a complex regional structure similar to that used by most modern MNEs. A few of Ericsson's business units are specialized to deal with different products and solutions. These solutions need to fulfill the demands and expectations of mobile network operators in different markets. Given the importance and power of their customers, Ericsson and its competitors need to devote significant resources and attention to individual customer units. Dedicated teams for technical and commercial sales, delivery, logistics, and support are allocated to each customer to manage the relationships and fulfill their expectations. Although corporate-level strategic decisions are managed at corporate headquarters, input from dispersed units is a key ingredient in Ericsson's technology and market strategies in that key customers can ask the CEO or other senior managers to meet certain expectations and can do so either directly or indirectly via Ericsson's key account managers.

When it comes to roll-out of the telecommunication standard technologies, it is quite usual for Ericsson to start the initial trials with lead customers who are technically and financially stronger and can afford the costs of rolling out the next generation of technologies so that they can enjoy the benefits of differentiation. This phased roll-out procedure, however, forms part of the long-term strategic product roadmap of the company and is done in a way that is very coordinated and aligned in terms of timing and speed of implementation. The Cloud, however, was not part of such plans, and its emergence and development has been too uncertain to allow Ericsson to formulate a unified technology strategy, let alone develop a coordinated roll-out plan.

### **2.4.1 Market Heterogeneity**

As a technology-driven company, Ericsson has been quick to realize the importance of Cloud-based technologies<sup>2</sup> and their implications. The company has a clear ambition to

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<sup>2</sup>Cloud computing is used to cover a wide range of concepts but there are two fundamental underlying technologies: network functions virtualization (NFV) and software-defined

become a leader both during the emergent technological change and after it, and in 2012 it announced its plan to develop a platform that would enable operators to drive new revenues and evolve network capabilities.

However, realizing this ambition has proved to be much more challenging. A key barrier to Ericsson's response to disruption is the market heterogeneity as its clients differ in how rapidly and to what extent they expect to adopt Cloud technologies. While one group of mobile operators have signaled a clear and ambitious intent to use Cloud technologies to redefine their networks and offerings, others are seeking mainly to use these technologies for efficiency gains and are not contemplating any major overhaul of their own technologies or offerings. Furthermore, in both groups there are some companies that started to adopt the new technology quite early on and proceeded swiftly with initial projects, while there are others that have delayed both their initial investments and their plans.

Our data (survey and archival) from 114 Ericsson customer accounts indicates a large degree of heterogeneity in its customers' expectations regarding the Cloud, showing these to vary according to their geographic location. Market-driven factors are linked to macroeconomic factors in different regions that affect the availability of resources and the motivation to embark on the risky and substantial investment required to deal with a disruptive technology. Our data show that 17% of operators from less developed or developing regions aim to adopt a wide and conflicting range of Cloud technologies; in developed regions similar ambitions are found in around 23% of operators. In addition, operators from less developed and developing regions tend to favor Cloud technologies that enable innovation rather than technologies to improve efficiency. This is very different from the operators from developed regions. In North America, Western Europe, and North East Asia we saw there was greater eagerness to invest in Cloud technologies and a stronger sense of momentum; this was true of 27% of operators in these regions, while in other parts of the world only 7% of operators were lead adopters of the Cloud technologies. In some other regions, there were few mobile operators who had made any significant effort to adopt Cloud technologies. In addition, there are regional differences in the magnitude of Cloud

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networking (SDN). These two technologies are mutually beneficial but not dependent upon one another.

technology adoption. Customers from developed markets are either highly or moderately ambitious in terms of their plans to adopt Cloud technologies, whereas those from developing markets have only low to moderate ambition. For instance, 40% of the operators in developed markets tend to invest in quite a wide scope of Cloud technologies.

Market heterogeneity has important implications for Ericsson and its response to disruption. Aligning itself to key customers and their strategies has been a cornerstone of Ericsson's strategy, and, given the increased competition, it has become especially important for the company to understand its customers' needs and plans and to try to influence them whenever possible. Due to its large size, Ericsson is dependent on repeat and new business from its global customers – and failure to be responsive to customers' expectations and demands may result in business being lost to competitors. Prioritizing one particular group of customers may not necessarily be the most appropriate approach, as it is difficult to predict how the industry may evolve, what the implications this might have for Ericsson, and how it could respond appropriately. To add to this confusion, there are also uncertainties about how aggressive competitors from the IT industry might target different parts of the telecommunication market with respect to Cloud technologies.

The diverse requests from customers make it impossible for decision-makers and managers at different levels within the organization to share a common understanding of what is happening and what needs to be done. We now discuss the conflicting interpretations within Ericsson regarding the market dynamics and the contradictory responses in terms of (1) experiments and trials, (2) deployment of resources, and (3) ecosystem strategies.

#### **2.4.2 Conflicting interpretations of the market dynamics**

While managers have their own predispositions – for example, because of individual differences and the specific division that they work in – the input from specific markets and customers encourages them to develop different understandings of the future, even though these may not be in line with the official stance of the organization. As a result, at any one point in time there will be different interpretations of the magnitude and speed of change in different strategic organizational units, and within any one unit these interpretations will also vary over time. To show more clearly how these understandings differ, we present four

interpretations of the market dynamics that differ in their estimation of timing and magnitude of the potential impact.

In the first interpretation, there is an expectation that customers will make some significant advances, but not very rapidly. According to this interpretation, a considerable proportion of the current network hardware and structure will be affected, but important parts of it will remain intact for the foreseeable future. The reason for this rather slow transition process is that first-mover customers will encounter various challenges in adapting their business, as was concluded in one of Ericsson's strategy discussions:

*“[Cloud] technologies and [their] use-cases [i.e. application] gradually mature to generate tangible benefits for operators, but complexity and investment limitations continue to cap deployment speed. Lead customers will still be a key challenge. [Especially,] the cost and revenue advantages of NFV [i.e., one of the Cloud technologies] are confirmed but complexity will remain a challenge. Lead operators can meet almost all milestones and the industry standards are mature by 2020.”*

The second interpretation foresees a similarly radical change, but one that takes place more rapidly. This view of the future predicts that first-movers will be very successful in their initial activities and assumes a fast business-driven change, reorganization, and changes in managerial practices. The expectation is that a large proportion of the telecom operators' current networks, infrastructure, and hardware will be replaced by Cloud technologies in the near future and only a small part will remain intact. Managers with this type of view of the future believe, for instance, that:

*“Large first-movers will have fully realized their IT/Telco Cloud ambition, and deployed completely virtualized and de-coupled multi-vendor solutions, in a five-year period of time [from 2014]. Followers will have also developed and accomplished their IT/Telco Cloud ambitions.”*

The third interpretation foresees a rapid but less drastic transition to the new Cloud technologies, in which a large proportion of the network remains unchanged; only the most

feasible and convenient aspects will be replaced by Cloud technologies, with the aim being to generate additional revenues or cost savings without any need for major adaptations. An Ericsson manager summarized this as:

*“After the first wave of investments, the ambitions of operators will diminish because of a lack of expected benefits of the Cloud ... The complexities of technology deployment will be uncovered: for example, interoperability issues place practical limitations on multi-vendor implementations as promised by the Cloud technologies. The result is a reduced scope of virtualization plans.”*

The fourth and last interpretation is one likely to be made by those who are suspicious of any radical change and who envisage that the failure of initial activities, due to factors such as slow progress in the activities required for standardization, will stop any important adaptation taking place for the foreseeable future. According to this interpretation, only a relatively insignificant proportion of the networks will be affected. This type of view was expressed by some Ericsson managers in a strategy discussion as follows:

*“In the telecom history, we have had other technological fads that did not make operators to radically change their core technologies ... Cloud technologies’ cost and revenue advantages are not proven .... This will not change in the near future. We should keep working on the quality and efficiency of our native technologies as they are the sources of our advantage. Perhaps [we can still] use the Cloud for this purpose too.”*

These various interpretations of the market dynamics were influential in driving the actions of those who held them. A large organization like Ericsson is decentralized to a large extent, and paying attention to customers’ input is always considered a priority. It is thus seen as a legitimate reason for action even when the action is not in harmony with the organization’s official stance. As we implied earlier, these interpretations were not formed arbitrarily, but were often a direct reflection of customers’ expressed plans of action in the short and the long term. It is important to note that, in terms of the organization’s overall position, the desire to minimize the disruptive effects of Cloud technologies was aligned

more closely to the interpretation in which change is seen as likely to be slower and more limited in scope. Conversely, those interpretations which predict the changes to be both more extensive and more rapid are much less in alignment with the organization's official position. Despite this lack of alignment, the regional units whose customers favor more radical approaches to the Cloud largely support such interpretations and regard them as a legitimate basis for action.

The fact that there are competing interpretations of the market dynamics, each involving conflicting assumptions about the technical and business implications, raises some important issues for the MNE. When there are multiple answers to the question of what is happening, this will inevitably affect key aspects of the process of adopting and implementing a potentially disruptive technology. Below, we discuss three specific types of contradiction that arise from market heterogeneity and how they affect different stages in the innovation process.

#### **2.4.3 Experimentation and trials**

To a large extent, telecom firms use trials and proof of concepts to help them make sense of the commercial values and work out the optimal implementation strategies for Cloud technologies. Keeping up with new technological trends compels firms to experiment in a variety of ways in their technology research and development, as one technology manager acknowledged:

*“[T]echnology evolution is so fast these days ... that if you as a product/systems owner don't regularly (every quarter) set aside money to evolve your technology base – even though no customer is asking for it – you will eventually find yourself with such a huge technology backlog that you have to start from scratch when suddenly it becomes a requirement from your customers – and you have to choose wisely because not all technology trends lead into the future.”*

Finding the right approach to collaboration in these initial investments (Moeen, 2017) was a key strategic issue for Ericsson, and the existence of competing visions of the future

makes it difficult to make a choice. Initially (2010), the experimentations were mostly small prototypes being developed by a dozen researchers at Ericsson headquarters. Expanding such activities required larger investment and more involvement from strategic business units and regional organizations. It was at this time that some key customers in various regions also started to ask Ericsson to participate in their Cloud-related developments and trials. The challenge here is that the success and failure of initial trials with key customers to a large extent determines future technological trajectories, and Ericsson often has to be careful therefore when committing to new development projects. In the case of the Cloud, however, the divergent customer plans and demands led to engagement in several streams of experimental activities which were not necessarily aligned with one another. One of the strategy managers involved in such projects explains what they were focused on in their initial development activities:

*“The underlying hardware platform will not be our unique selling point anyway. [We should] allow ourselves to focus on the differentiating functionality of our services [...] and quickly launch trials where there are opportunities and see if the business takes off.”*

There were other more radical initiatives launched at this time. In Budapest, for example, Ericsson introduced a new concept called Ericsson Garage, designed to take a more fundamental approach to Cloud-related innovations. In this new platform, Ericsson envisioned having little control over the types of activities being undertaken by entrepreneurs, and therefore divergent experimentations were inevitable. The head of the garage explained the purpose of this initiative:

*“I believe the new Ericsson Garage will strengthen our foundation for creating sustainable business for Ericsson and its customers in a networked society. For example, we can look at one area that the garage will showcase: Cloud and virtualization technologies as the first step. We believe this area will transform the economics of delivering new services to market.”*

Besides the divergent and more radical trials, Ericsson started to collaborate in some focused trials with a number of key customers in different locations who were focusing

mainly on gradual and incremental projects designed to add limited Cloud functionalities to their infrastructure. These projects were indeed quite successful in delivering the intended outcome and were celebrated as initial Cloud successes. In addition, Ericsson tried to create some dedicated resources focused on addressing customer demands with respect to the Cloud. In 2014, the firm opened three experimental labs, in Germany, Italy, and South Korea.

In sum, Ericsson was following different trials with varying motivations. Some were more internally focused, slower-paced, and more conservative, and were designed to provide *“More local expertise close to the customers [and] be more open, listening, and sales driven”* (SUR, ACM1114). Others were aimed at more rapid and larger-scale change in the industry. Account managers supported this second idea when they said, *“[Ericsson should] dramatically embrace a strategic IT transformation partner role” ... and “have relevant competence and capabilities on the ground.”* (SUR, ACM1114). However, involvement in many diverse experimental projects, each with a different magnitude and speed, is costly in terms of the effort required.

#### **2.4.4 Deployment strategy**

Another key question for Ericsson concerned the plan for product road maps and the changes required for commercial deployment, or market entry (Moeen, 2017), of Cloud technologies in existing products. Different interpretations of the future result in different approaches to updating and revising the product roadmap and strategic plans used as the basis for operations by thousands of product managers and engineers at Ericsson. At Ericsson, product roadmaps are meant to be intact and many groups of managers and engineers, who had a conservative interpretation of future, simply updated their product plans by adding Cloud technologies on top of existing technologies. These groups worked closely with large customer organizations who also had a conservative understanding of future and a tendency to preserve their prior investments and technological stability.

More radical interpretations of the future were used when setting deployment strategies as well. Those who held such views suggested that the existing architecture and

related complementary assets should be discarded in favor of a new architecture and assets, and to what extent this should be done.

In line with this interpretation of the future, a group of experts at Ericsson started to develop new software applications that were not dependent on the firm's legacy networks and were therefore attempting to deploy projects that were largely independent from Ericsson's existing product roadmaps. When dealing with more progressive customers, it was important to emphasize this approach in order to position Ericsson as a reliable partner in more radical innovation projects. As one operations manager said: *"[At Ericsson, we] have to fully align and "cloudify" and virtualize our [product and service] portfolios."* (FOR, CLD-515)

As one would expect, the radical approaches towards change were not focused on a single path to change, and issues relating to several different architectural and business models were given serious debate. For example, whether Ericsson should utilize third-party data centers or should establish its own data centers was an important consideration when discussing cloudification of the telecom network:

*"Personally I'm [a] little bit concerned with a strategy where we basically would just be providing some of the software running in Amazon's data centers. [...] We have been around a lot longer than Amazon and are also building data centers for our own needs anyway. Why not leverage that investment to also provide hosted services to operators?"*

#### **2.4.5 Long-term ecosystem strategy**

Cloud and related technologies were expected to have effects that go beyond firm boundaries, and this may entail the potential for addressing new markets and customers. While addressing the divergent demands from existing customers is already problematic, attempting to undertake innovation activities focused on new types of customer in the emerging ecosystem complicated things even more. Misalignment with the speed and scope of some customers was inevitable, as we have already discussed; however, working against the interests of the current customer category (i.e. mobile operators) by developing solutions

that did not support customers' businesses was perceived to be inherently problematic. This was not only because the firm was expected to show loyalty to its existing customers, but also because a shortage of resources made it difficult to carry out exploration activities focused on the firm's existing customers and ecosystem. Therefore, many of the managers believed that Ericsson must "*excel at [its] core business before branching out,*" meaning that it was important for the firm to maintain and nurture its existing role in a business ecosystem that remained more or less the same.

Ericsson started to engage in several new segments, including transportation, government, utilities, health, and education to develop Cloud technologies that would serve customers outside its traditional market segment. The importance of new customer segments and groups in the emergent ecosystem was not in doubt. In the words of Ericsson's CEO:

*"We are focusing on increased visibility and scale of skills in [new customer categories, which are] IT and Cloud, media, and industry and society to better support [these new categories of] customers in their digital transformation. It is now the right time to seize further opportunities by better aligning to their needs, both of our existing customers, and also new customers in segments beyond the traditional telecom space."*

The activities in these new segments were in constant competition with those in the regular market, and because of the prominence and power of conventional businesses, it was often very challenging to secure the required competence and resources to explore new markets.

In addition to questions over the roles of existing and new customers, Ericsson's supplier and partnership strategies were also subject to different interpretations. Those with more radical visions of the future tended to favor redefining the role of the technology provider and focusing on who the suppliers and allies were likely to be in the longer term. This group maintained that, with respect to suppliers, Ericsson needed to make important changes:

*“[Ericsson] currently [has] limitations or dependencies with 3PP [i.e., third-party providers] and needs to lead the segment and to be considered ICT leader company in 2020. Ericsson has to engage in a better corporate venturing and partnership abilities to tap into the growing number of start-ups driving innovation in the ICT industry. For example, [they should] create strategic alliances with Silicon Valley key influential companies in the Cloud ecosystem.”*

According to this group of managers, Ericsson needed to increase its “go-to-market-ability to sell jointly to new end-markets”. In our online survey account managers reflected on what they saw as responses to the change needed in the ecosystem, referring to the importance of “open integrations for non-Ericsson equipment (at least the image should change)” and of “not pushing for Ericsson Cloud but rather being open to accepting ANY Cloud interpretation coming from customers that can be very different.” They also made the point that “large operators focus on hardware savings where Ericsson is too expensive. [Therefore, it is needed to] focus on providing vertical integration with IT companies to develop on E2E system integration capabilities [because we will not be able to sell all our native hardware].”

The fundamental issue here is that focusing on developing a new ecosystem and businesses is not in line with maintaining an ongoing commitment to the firm’s current networks of suppliers, customers, and complementors. In fact, some aspects of future ecosystems may directly damage existing allies and supporting this kind of change may have negative consequences for the firm. Table 2.2 presents a number of representative quotations which highlight the tensions created by market heterogeneity.

In this section, we have shown how differing understandings and interpretations of the future influence managers’ approaches to innovation processes. Each of the regional and customer units were attempting to do something to satisfy the demands of their own customer groups. Specifically, this analysis suggests that different regional and customer units within Ericsson were adopting different approaches to experimentation and trials which were inconsistent with one another and sometimes with the official stance of the company. While the business unit managers tended to favor more incremental and gradual

approaches to innovation activities and strategies that would help reduce the disruptive effects of the Cloud, Ericsson's research department and units that were dealing with more ambitious customers were looking at more radical trials and at deployment and ecosystem strategies. In the next section, we look at how such inconsistencies affected Ericsson's strategic choices and behavior.

#### **2.4.6 Accommodating a complex innovation process**

We have highlighted how there were multiple visions of the future that were rooted in market heterogeneity and that led to complexities in Ericsson's innovation processes and strategies with respect to the Cloud. While the list of inconsistencies that we present is not meant to be exhaustive, it creates a basis for understanding the types of strategic dilemma that an MNE must deal with when there is technological disruption on a global scale. Differences in interpretations of the future and thus in approaches to the innovation process have important implications for key dimensions of Ericsson's strategy, particularly its strategic direction, structure, and resource reconfiguration. In Table 2.3 we present representative evidence of these implications.

**Strategic direction** – As highlighted above, for legitimate reasons, different groups of decision-makers had different visions of the future and therefore tended to favor approaches that were inconsistent with one another. Ericsson's senior management used an approach that resulted in a high level of ambiguity in the firm's formal strategies with respect to the Cloud and meant that managers and units were able to engage in very different innovation activities and approaches. Giving out seemingly contradictory messages, and letting business units follow their own preferred strategies, were some of the ways in which the firm's approach to strategic direction allowed these very different activities to evolve. For instance, looking only at Ericsson's vision and formal strategies, one might infer the company had put emphasis on a high level of alignment in Cloud-related strategies. For example, in 2010 Ericsson's CEO formulated a clear vision for the company, one which reflected its aspiration to be the industry leader, and stated that he expected an aligned approach to change:

**Table 2.2– Representative quotations reflecting contradictory interpretations of the Cloud** (Continue on the next page)

	Dimension	Example quotations
Interpretation of the market dynamics	Rapid, large-scale changes	<p>Customers will move ahead with Ericsson or without Ericsson, so we need to act fast.</p> <p>With the Cloud, we need to have a view based on what’s going to be in one or two years... the future technology will be replacing existing businesses.</p> <p>Ericsson should fully align and cloudify and virtualize our product portfolios during the coming years.</p> <p>Cloud affects so many things with new business model, with new technology, etc. It affects the whole of the organization; it changes the industry.</p> <p>We should quickly expand the scope from being a technology supplier into doing operations, doing different business models, potentially financing and those kinds of things, transacting CAPEX into OPEX, those kinds of things. [Anything that has to do with the actual technology] to do with the actual technology.</p> <p>Cloud is very disruptive to the telecom business model. The telecom business model is about [increasing] complexity and having [a] vertically integrated and very well-tested network down to the component level. So, you make the system in a different way when you are working [with] this sort of high-quality IT approach rather than the telecom approach.</p>
	Slow-paced, small-scale changes	<p>I think the practical impact [of] Ericsson’s ... Cloud will still be smaller than [what] it looks when you do this analysis, where it looks like everything will be changed. But just because of the main sources of revenue for us, it will be a smaller impact, especially because of the base stations and so on. That [the Cloud] will be one of the less important elements, I guess.</p> <p>They [some main customers] are very conservative and will bring new things in much slower than what is possible. So, I think when it comes to timing as well, we have to try to do a lot of work estimating how quickly this can really go, both when it comes to our own products but also when it comes to what our customers can do [for] their end customers.</p> <p>In 2010, every telecom provider wanted to have [its] own Cloud. What happened in the past six years? Even big names, they all have their own infrastructures, etc., but who is using them? It is very rare, and it is not good at all. Since it is not their core business.</p> <p>Cloud can be realized in so many ways. The Google Cloud and the Amazon Cloud is one way. And then we have the enterprise Clouds, the private Clouds, the telecom Clouds, and they have different needs, and the timing of these different aspects can be probably discussed – when they will happen, and so on. But the telecom Cloud, it is just the best that could happen for Ericsson, I would say, to leverage upon existing technologies.</p>

**Table 2.2– Representative quotations reflecting contradictory interpretations of the Cloud (Continue)**

Experiments and trials	Diverse trials with many customers	<p>Present some new ideas, talk to different customers: if they like it, move on. So, that is an example of a disciplined experiment in an innovation project.</p> <p>Yes, we need to do experiment, but not just one type of experiment: we shouldn't sell a prototype to a customer. We shouldn't think in a very one-dimensional way then. And for the Cloud, we need to make it more intelligent, with different types of experiments and customers.</p> <p>If you already have an idea in your mind that you want to push, you don't listen any longer because you hear those things that fit to yours that you would like to push. And you might miss out a few important issues ... We [come] to a long list here: Telefonica in various countries, Turk Telecom, Hutch, Orange, Portugal Telecom, AT&amp;T, Vodacom, Safaricom, EPT Luxembourg, Belgium, Swisscom, Swisscom IT, and so forth. There is a tendency in [working with] Ericsson, in many cases, to—you have selected customers.</p> <p>We have in the service organization know-how [on how] to integrate IT things in North America. They are competent, whereas we have no staff in maybe India, etc. So, it varies geographically. But the threat is that our competitors are active in India, for example. They know the local requirements and solutions.</p>
	Focused trials, only with key customers	<p>Consistently bring new ideas to AT&amp;T who are looking to leading suppliers to co-invest with them in new domains.</p> <p>When I come from the Cloud program and say, hey, you should make your product Cloud-ready, those from other departments will ask: where is the money? Are there customers asking for it? And I will say, there are some advanced customers.</p> <p>We don't want to open up discussions with all of the customers unnecessarily. We see the customers that are talking about Cloud and their requirements.</p> <p>Do we have a shortlist of customers, so it's like three key customers identified? Ericsson is heavily engaging with them in all pre-commercial phases, very much in the technology phases.</p>

**Table 2.2– Representative quotations reflecting contradictory interpretations of the Cloud (Continue)**

Initial deployments	Redefining the portfolio of offerings	<p>We really need to change the content of our portfolio radically because we have identified something that really threatens the way that we are doing things.</p> <p>If you move into another area such as Cloud, this is something that you don't have under control. This is like the wild west out there where, you know, like, small start-ups can change overnight, and they do... suddenly it is totally out of Ericsson's comfort zone. Then there is a challenge. And then it gets very complicated. Cloud is very big. Therefore, it's very difficult to get a grip on it.</p> <p>Cloud affects so many things with new business models, with new technology, etc. So just being able to talk with each other and understand and have a continuous dialogue, a discussion. That is a major obstacle. It affects the whole of [the] organization, it changes the industry.</p> <p>When it comes to Cloud services [the proportion of resources we allocate in comparison to the traditional business is] a 30/70, maybe 20/80 or something like that, 20/80. We need to change the support systems. This could be educating salesmen. [In] data centers, [it should increase and become] let's say, 40/60 maybe, 30/70.</p> <p>If we want to build products according to the Cloud architecture and Cloud business model, then it's going to be a huge impact because this is horizontally layered architecture and it's a business model that is totally different. That's totally different from what we are doing today selling boxes, sort of; pay-as-you-go services probably in the future.</p>
	Close to the existing portfolio of offerings	<p>I think there is part of what I would consider as Cloud that is close to what we were doing before, so we were investing anyways [in] products that were useful.</p> <p>We sensed Cloud as a topic until we [were] looking it in connection with our portfolio and [seeing] how we [could] apply Cloud.</p> <p>The first step is establishing the teams that are going to run small innovative projects ... to get the right level of attachment to your existing business, and that's the art of an innovator.</p> <p>When we talked about problem in [the] connection platform, we said, why don't we look at this as a Cloud business, because it will generate more money for us when compared to [the] traditional way and be more future-proof.</p> <p>We can say that we are cloudified, even if we continue doing what we're doing.</p>

**Table 2.2– Representative quotations reflecting contradictory interpretations of the Cloud**

Ecosystem strategy	Disturbing the existing ecosystem	<p>[We don't] necessarily [have to] increase profitability but [we can also focus on] growing our revenues by focusing on new offerings and new customers as well. I think a challenge that we have in Ericsson is that we are a company [which] is only very good at driving business with mobile operators [i.e. existing customers]. We should have better corporate venturing and partnership abilities to tap into the growing number of start-ups driving innovation in the ICT industry.</p> <p>So perhaps we need to focus on some targets other than revenues and profitability – for example, putting some money [into] new ideas or getting new customers [for] Cloud solutions somehow.</p> <p>We should create strategic alliances with Silicon Valley key influential companies in the Cloud ecosystem.</p> <p>My competition is ... not Huawei. I don't see them in my engagement. My competition is HP, IBM, and the traditional IT equipment suppliers.</p>
	Supporting the existing ecosystem	<p>We can say that we are cloudified, even if we continue doing what we're doing. ... I think we need to listen to them, what plans they have. I mean, the whole internet is becoming a huge Cloud... I mean, so that is happening. But will telecom be a huge Cloud in the future? I doubt it will be.</p> <p>Consider enterprises, for example. When ... will they be cloudified? Will enterprises really trust Google or Amazon or another Cloud provider to put their most secret [and] precious documents, strategies in their databases. The telecom operators, our current customers, are the companies that can help out there.</p> <p>We need to focus on what our customers want to do in the future. I think we need to listen to them, what plans they have.</p> <p>I think it's going to be an evolution, yeah. And we see doubts about the consumers. They realize that they are giving away so much information [on] Facebook and everything, so that it could hit back. In fact, so the public Cloud could be questioned as a reliable service provider in the future.</p>

**Table 2.3– Representative inconsistent strategic responses by Ericsson**

Strategic dimension		Representative incidents and activities
Strategic direction	Unified	<ul style="list-style-type: none"> <li>- Articulation of a shared vision, reflected in the strategy plans of all units (2010–2014).</li> <li>- A steering committee reporting to CEO to align Cloud initiatives (2012).</li> <li>- Incorporation of the Cloud in the official product roadmap (2013).</li> </ul>
	Versatile	<ul style="list-style-type: none"> <li>- Emphasizing the ‘customer first’ approach (2011–2014)</li> <li>- Allowing local Cloud projects in different units with different agenda (2011–2014).</li> <li>- Focus on development of the next generation of hardware products while letting other units work on technologies that will potentially replace that generation of products (2012–2014).</li> <li>- Allowing projects that are not in line with the official product roadmap.</li> </ul>
Structure of Cloud initiative	Centralized and coordinated	<ul style="list-style-type: none"> <li>- Centralizing decision-making for the Cloud in the largest business unit (2011).</li> <li>- Reassigning the decision-making for the Cloud to the largest business unit (2013–2014)</li> <li>- Establishing Cloud business unit (2015).</li> </ul>
	Decentralized and uncoordinated	<ul style="list-style-type: none"> <li>- Organizing high-level coordinating and cross-functional teams for Cloud technology (2012)</li> <li>- Establishing small Cloud sub-units in different units (2012–2014)</li> </ul>
Resources Configuration	Redeployment of existing resources	<ul style="list-style-type: none"> <li>- Freeze on staff numbers (2013–2014). Matching Cloud initiatives to existing employees.</li> <li>- Increasing the number of Cloud-technology-certified engineers to over 300 persons for a single region of 23 countries.</li> <li>- First independent sales summit on Cloud technology (2014). 600 of Ericsson’s sales force focused on Cloud.</li> </ul>
	Acquisition of new resources	<ul style="list-style-type: none"> <li>- Laying off employees for three successive years (2012–2014) and recruiting recent graduates to replace them for Cloud-related activities.</li> <li>- Three new R&amp;D centers focused on Cloud computing, with 700 new recruits.</li> <li>- Acquisitions in Cloud technology: Ericpol (software development in Cloud and IP), TimelessMind (software systems integration), Sentilla (analytics over Cloud), and Telcordia (IT support for Cloud technologies). Alliances in Cloud technology: OPNFV (industry alliance) and Clever Safe (partnership).</li> </ul>

*“Management has taken action to adapt the company to this change that is an important foundation for Ericsson’s future growth. [...] We will get there with aligned strategies in all of the business units, as well as with our joint ventures”*  
*Ericsson CEO, internal blog, 2010*

However, and despite emphasizing the need for “full alignment of all regional and business unit strategies” in several of his communications, the CEO also stressed the importance of a “customer-first perspective,” which implied that Ericsson must work hard to understand operators’ needs, objectives, and constraints. He went on to say that:

*“In today’s market, however, we are seeing a clear shift toward building customer intimacy by being more agile, more flexible, and responding to customer demands with a different mix of specific solutions and global ones. Our primary aim is to help customers reach their targets and address their needs.”* *Ericsson CEO letter, 2010 annual report*

Hence, while strategic alignment was being emphasized, great attention was also being paid to responsiveness to customer-specific demands and expectations. Indeed, the emphasis on responsiveness to and closeness§ with a heterogeneous market – and high levels of decentralization and delegation to enable this – gave rise to contradictory visions of the future in different parts of the organization and reduced the pressure to pursue a uniform global strategy. Hence, the high-level vision of the organization did not result in a correspondingly high degree of alignment and harmony in the actions taken by the organization. In fact, it was apparent that those units and employees dealing with less advanced customers or with developing countries were focusing on less radical variants of the strategy and taking a more gradual path towards Cloud deployment. Others tended to focus on visions of the future in which the existing network structure and the associated products and solutions would have to change substantially and in which incremental changes to existing products were perceived to be less valuable. Despite not being aligned to one another or to the official strategy, the various approaches to Cloud adoption and implementation still had a high degree of legitimacy, because each was supported by a reasonably large customer base.

**Structure** – Our observations confirm that there is a pattern in the density of individuals and groups within the firm who favored particular visions, and this maps to the organizational structure. While the disruptive impact of the Cloud concerns almost every aspect of Ericsson’s products and services, in the earlier stages of technological change only those groups that were outside the existing business units tended to be strongly in favor of a radical approach to Cloud deployment. The business units demonstrated little willingness to support ambitious plans as this was not in keeping with their existing incentive structures and abilities. A manager who had been involved in developing Cloud-related services explained how the initial processes in Cloud-related innovation worked:

*“We have these innovation cells which are small teams which have a goal, but they don’t have processes and just work on a daily basis. Of course, a company can always have these innovation cells. But the difficulty is when you have initiatives, such as ten innovation cells in parallel, and all of them go back to the existing line organization – which is modular, as we talked about – looking for information and assistance, and so on. Then we start to overload these traditional modules with work that they are not dimensioned for, so the innovation cells will not get the support that they need and that will become a pain in the neck for the module.”*

Intensified competition meant that the business units were under pressure to achieve greater efficiency and performance, and investment in future visions that could potentially undermine existing revenue streams was not a preferred option for business unit managers. Reliance on existing customers and their investment plans was a key reason why units were unwilling to support a radical move. The issue became apparent to senior managers when they received a signal from a few leading customers that Ericsson was being perceived as a laggard in terms of the Cloud. This was a trigger for several rounds of restructuring. The main reason behind the restructuring was to create a cross-functional team that would be in keeping with the disruptive nature of the Cloud, which affected all teams within the business. Creating such a team would also be in line with the plans of the company's more ambitious customers. One manager explained the initiation of this program as follows:

*“... we started to get RFQs from one key customer in the Cloud area. And also we had a lot of questions around not only new solutions but also how our existing portfolio would transform related to Cloud- and service-based applications, and so on. So, the Cloud program was initiated.”*

Having a centralized lead and access to resources from different business units seemed to be the right solution for proceeding with strategy formulation, experimentation and trials, and other activities required in order to respond to market demand for ambitious utilization of Cloud potential. Starting with a small cross-unit team to develop Cloud technologies, company managers soon realized that it was very difficult to access resources dispersed across different business units that were themselves busy dealing with existing situations in the market. In order to overcome this, the company decided to dedicate more and more resources to a cross-unit Cloud initiative. Although this approach had some advantages in terms of allocating resources to more ambitious experimental projects, the cross-unit initiative became too large, creating many administrative issues. The company decided to dissolve the cross-functional unit and to embed it within the largest business unit, which had most of the available organizational resources. One manager described this change as follows:

*“... the Cloud program set up was a good start but sooner or later it had to be transferred to something else. I think when we want to spend a lot of money and so on, then that will be typically handed over to a line organization that we decide.”*

Although this move eliminated the administrative issues connected with having a temporary unit, and at the same time allowed ambitious Cloud projects to continue, it did not take long before the pressure to generate revenue and achieve financial targets meant that more ambitious projects and activities were losing out to more incremental development projects. Another round of cross-functional activities began but the results were not regarded as adequate. It was at this point that the company decided to go for two major restructurings that resulted in a new business unit dedicated to Cloud technologies. While having a new business unit with its own resources to some extent guaranteed a longer-term orientation to development activities, the fact that it was a profit center drove the new unit to seek more

immediate revenue streams, bringing it more into line with the slower and less ambitious plans. More cross-functional projects were therefore needed to ensure that the company maintained a focus on more radical visions. At the time of writing this paper, there have been around seven years of repeated restructuring and reassignment of resources for Cloud technologies, and these changes – albeit all made for legitimate reasons – have been very costly and created tensions within the organization. Employees often perceive the changes as stemming from a lack of vision and sometimes become frustrated because of the uncertainties surrounding the structure of Cloud initiatives.

From the negative experiences of employees during the various restructurings one could conclude that the changes made were either based on poor decisions or badly executed, but one needs also to recognize the complexity of the problems involved. It is also important to note that, although the cross-functional unit was officially responsible for dealing with the Cloud, this does not mean that other groups were not active in this area. On the contrary, several research groups and business units had their own initiatives, addressing their own interests. There was thus a complex combination of separate cross-functional teams and integrated intra-unit projects dealing concurrently with the new technology.

**Configuration of resources** – The focus on specific visions of the future has implications for the ways in which existing organizational resources, particularly human resources, are planned for and reconfigured. An Ericsson strategist put this in the following words:

*“[To] leverage the market transitions in the right way, it will require changes to culture, incentives, organization, and new talents and new investments.”*

A slower and less ambitious transition would enable Ericsson to evolve more gradually and redeploy its existing staff through training and development programs. As those in the older generation leave, the firm would be able to recruit people with new competences. This approach to redeploying employees may minimize internal challenges and tensions as well as issues with unions and other stakeholders. Two operational managers working on the development of Cloud technology talked about on-the-job training in the following terms:

*“[With respect to the Cloud,] we really have the needed competence, also here, even if it’s of course, a fairly limited amount of people. We didn’t hire so many people. Very few. ... [L]earning in Ericsson over the years has become much, much more on-the-job training... it’s very much around trying to get people to work where we have the action [for Cloud technology development] ...”*

*“people take a huge responsibility for training themselves to keep abreast of technology development and I was impressed with what they knew and achieved...”*

One key approach for developing capabilities and resource from this perspective is to gather a cross-functional group of engineers to learn by working on the technology, and then to dismantle the team and spread that knowledge throughout the organization.

*“One of the ideas with the initial Cloud program was to get people doing things together, to have a chance to get other people in that project to learn and to have hands on experience during the pilots, trials and so on. Then they go back to their organizations [and spread the learning] ... today, it’s going to be much more around this competence spreading as we’re doing something between the regions, but really trying to identify where do we have the sources of knowledge [to spread].”*

However, where the vision was more radical, a large proportion of the company’s current employees did not have the requisite skills and abilities, and the company needed to recruit many new people, with a different set of competences. Acquiring these new recruits, however, necessitated major cutbacks. According to Ericsson’s annual reports, between 2010 and 2014 an average of 13,500 employees left the firm each year and 16,500 employees joined, while the total headcount per year averaged around 110,000 persons. The number of employees leaving the company increased over this period.

The business units naturally favored redeploying existing staff and avoiding major changes in order to continue the planned evolution of products which most of the units’ customers had built into their plans. The issue was that when business units were pursuing

their deployment plans, they were likely to favor the immediate and least ambitious approaches, mainly because of the difficulties associated with major reconfiguration of resources. However, once the technology started to have an impact on different parts of the product portfolio, it became apparent that certain groups of employees were no longer needed, and at the same time and could not be developed in the short run. The only solution to this was to lay off a large group of experienced people and to recruit new staff. While such solutions resolved some of the problems regarding the competences and skills required to deal with Cloud technologies, the tensions and challenges associated with laying people off made it even harder to start bringing in any new recruits until the next round of major resource reconfiguration.

Our observations confirm that the firm tried out a variety of contrary strategies and approaches in order to enable an innovation process, which itself contained inconsistencies; this was a reflection of the different and often contradictory visions of the future that existed within the organization. Analyzing Ericsson's case, we identified some desirable outcomes as well as a number of unresolved challenges.

Our analyses suggest that Ericsson was able to leverage strategic ambiguity in internal communication to stimulate and legitimize a range of different activities. An important enabler here was the decentralized organization that was helpful in letting people make their own interpretations based on market insights that were not necessarily available to central decision-makers. Being open to and capable of making swift structural changes, sometimes involving thousands of individuals, and able to embrace the subsequent challenges so that the new technology could be adopted was certainly necessary and helpful for dealing with the fact that there was no one shared interpretation of the future. Finally, having a variety of resource development and acquisition strategies enabled the organization to accommodate both radical and more gradually evolving views of what the future might hold.

On the negative side, however, it has proved quite challenging for Ericsson to accommodate those visions of the future that were outside the organization's comfort zone or not in line with its official position. Several progressive members of the organization told

us that they are allowed to do the research that they want, even if their activities are at odds with what senior managers are asking for. However, when they require support and resources from other units which foresee changes taking place at a slower pace and in a more limited way, they will not be given what they need to succeed. Also, while with more radical approaches failures are understandably more common, and while those who favor a more cautious and conservative approach can demonstrate initial success relatively quickly, by securing trials and even contracts with customers, with more advanced innovation the learning outcomes often look less impressive – even to customers who advocate a more ambitious approach. Hence, while senior managers allow competing interpretations and activities to co-exist, it does not mean that these are given equal amounts of attention and resources.

## **2.5 A model of firm response to technological disruption in heterogenous market environments**

In this section, we reiterate the model of responding to technological disruption when firms face market heterogeneity. Ericsson's efforts to respond to the rise of Cloud technology and the risk that its value creation and capture models would become obsolete indicate that market heterogeneity creates a situation in which a direct and unified response to disruption might be less appropriate than a response which uses misaligned and contradictory approaches to address the environmental complexity. Large MNEs like Ericsson are embedded in multiple environments with different technological sophistication and demand requirements. This leads to different interpretations of the future in different parts of the organization. That is, while there might be agreement across the organization that there needs to be a response to disruption, there can be significant disagreement regarding the scale and the speed of changes required. This is not merely a matter of different perceptions in different organizational units but is grounded in actual differences between customer needs in different markets.

A successful response to disruption in conditions of market heterogeneity is one that preserves the firm's strategic relationships with heterogeneous customers and one that allows strategic flexibility (Khanagha et al., 2017; Volberda, 1996) to expand the range of

strategic options available to the firm – in other words, a response that allows the firm to implement change in a way that does not lead to the loss of key customers or lock it early on into a response that eventually proves inappropriate. As the Ericsson case suggests, developing such a response involves establishing a complex innovation process and managing internal misalignment to support divergent approaches to innovation. A complex innovation process is one that accommodates various approaches to experimentation (e.g., investment in radical new models of centralized innovation but also decentralized trials with key customers), varying deployment strategies (e.g., providing solutions close to the existing portfolio of offerings and also redefining the portfolio), and engagement in divergent long-term ecosystem strategies (e.g., on the one hand supporting the existing ecosystem by investing in initiatives with existing suppliers and customers, while on the other hand disturbing that existing ecosystem by questioning who the firm's suppliers and partners should be in the long term). Having this kind of flexibility within the innovation process allow firms to deal with differing expectations in different parts of the organization regarding the magnitude and speed of response and the complex environment in which they operate.

These discrepancies in the innovation process – rooted in the different interpretations of the future in different parts of the organization – are possible only if the organization allows there to be internal misalignment regarding its strategic direction, structure, and reconfiguration of resources. While the top leadership provides a clear message that responding to disruption is essential for the firm's survival, it might support multiple interpretations of the future in global units by giving ambiguous signals as to whether it favors a unified or more multi-pronged organizational response. The Ericsson CEO achieved this by formulating a clear vision of a unified response to the Cloud, while outlining customer-focused strategies in other communications. In addition, to allow for the different approaches in the innovation process, organizations need to manage internal misalignment with respect to the organizational structure. Structural flexibility characterized by fluidity between a multiplicity of approaches to structuring ranging between uncoordinated and decentralized structures to highly coordinated and centralized. In the Ericsson case, this was visible in how the company switched between different ways of structuring its Cloud-related research efforts, going from centralized to decentralized, and

vice-versa. Organizations can allow for inconsistencies in the innovation process by providing resources for divergent paths. This can be done by alternating between redeploying existing resources and acquiring new resources.

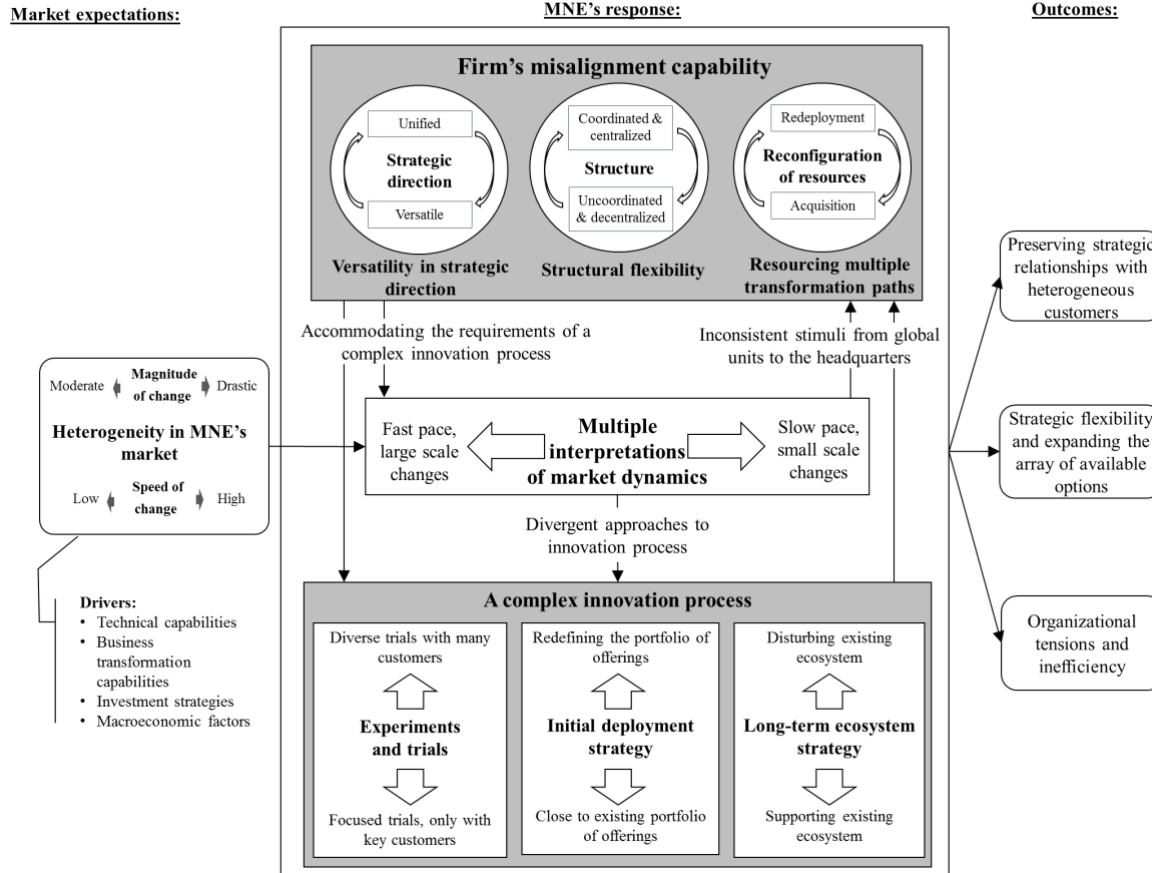
The proposed model for responding to disruption is likely to be more appropriate in situations where there is high market heterogeneity of the kind faced by MNEs, rather than in the more homogeneous markets served by some other firms. Similarly, this approach might be more appropriate than a unified organizational response when it is unclear what the best form of response should be. A key challenge in the approach taken by Ericsson is that leaders need to be capable of overseeing organizational misalignment. This requires leaders to be capable of embracing strategic contradictions (Mihalache et al., 2014) and of supporting inconsistencies in the innovation process by giving out mixed signals while at the same time satisfying external stakeholders that there is indeed a reasoning behind the response. Figure 4 illustrates our theoretical model of the complexities that MNEs face when dealing with disruption.

## **2.6 Contributions**

Our study aims to increase understanding of how large firms respond to technological disruption. We answer calls (Kor and Leblebici, 2005; Kor and Mesko, 2013; Sirmon and Hitt, 2009) for a deeper understanding of the complex interdependencies between the firm's strategic choices about resource development, deployment, and investments. As contended by Kor and Mesko (2013, p. 241), "it is these multilevel asset-strategy interdependencies that are at the hearth of a firm's ability to achieve internal fit, external fit, and evolutionary fit." Our study offers three main contributions to ongoing debates in the technology and strategy literatures.

First, by uncovering the mechanisms through which demand-side heterogeneity affects responses to disruption, we complement earlier work on technological disruption (Adner, 2002; Adner and Levinthal, 2002; Adner and Snow, 2010a, 2010b) that emphasized the need to consider market heterogeneity in order to understand technological disruption.

**Figure 2.4– Technology disruption, market heterogeneity, and the implications for MNEs**



We also add to later research that suggested that focusing one's strategies on demand-side heterogeneity can lead to superior performance (Priem et al., 2012), particularly in the context of two-sided markets and platform ecosystems (Cennamo et al., 2018; Rietveld and Eggers, 2018). Specifically, our study reveals that market heterogeneity and conflicting and potentially contradictory customer demands give rise to divergent interpretations of the future and of what needs to be done to deal with the new technology. These divergent interpretations, in turn, engender inconsistent and potentially contradictory strategies and practices. We identify factors such as allowing multiple strategic directions, providing structural flexibility, and using inconsistent strategies, either concurrently or sequentially, as being important for managing such contradictions effectively during technological disruption in heterogeneous markets. These findings resonate with recent developments in the conceptualization of strategies for dealing with paradoxes in complex environments and emerging ecosystems (Ansari et al., 2016), and they extend prior research that considers the importance of customers in incumbents' responses to technological change without incorporating the effects of market heterogeneity (e.g. Gilbert, 2005; Lavie, 2006; Taylor & Helfat, 2009).

Second, we contribute to the literature on incumbents' responses to technological change by conceptualizing and highlighting the importance of firms' misalignment capability, namely their ability to allow and manage misalignment in order to cope with the complexities of a technological disruption. Prior research suggests that the fit between environment and strategy is a critical factor for performance in complex and dynamic market settings (Luo and Park, 2001; Tan and Litsschert, 1994) and that this should be supported by internal fit (i.e., the alignment between internal aspects of the organization such as strategy, structure, and organizational activities) (Peteraf and Reed, 2007). However, our study suggests that this is different in heterogeneous markets. When firms respond to disruption and consider their fit to contradictory environmental requirements, the value of internal fit diminishes, and misalignment capability becomes more relevant. We identified three specific underlying dimensions for such this capability. One dimension of misalignment capability relates to the appreciation and nurturing of versatility in strategic direction. Prior research suggests that unified strategic direction (Dess, 1987; Taylor and

Helfat, 2009) is of paramount importance during strategic change processes. However, our findings suggest that strategic unity may work against the ambition to expand the range of options available to the firm and to maintain the strategic relationships with key customers. While the idea that inconsistency detracts from the internal fit between organizational elements (Boumgarden et al., 2012) might lead one to expect an organization to adopt internally consistent approaches, our case study indicated that accommodating and even nurturing inconsistent visions of future may be unavoidable and even vital. The second dimension of misalignment capability has to do with resource strategies. Our study suggests that rather than a ‘best fit’ approach (see Karim & Capron, 2016; Lavie, 2006), different resource reconfiguration strategies may be needed at various times and in different units of the organization. Our case study suggests that organizations dealing with complex environments may need to use a combination of redeployment strategies, rather than a single contingent-fit approach. The third dimension of misalignment capability relates to structural mechanisms and organizational redesign. Our case also confirms theories that emphasize the importance of a dynamic approach to organizational structure (Boumgarden et al., 2012; Gulati and Puranam, 2009; Kang et al., 2017; Nickerson and Zenger, 2002), and we conclude that a high level of structural dynamicity may be essential to enable an internal learning process to take place when a high level of uncertainty and multiple interpretations of the market dynamics make it impossible for the firm to reach a unified vision of the future.

Third, we contribute to the international management literature by revealing how market heterogeneity affects the processes of renewal in MNEs. Prior research has considered the effect of market heterogeneity on MNE subsidiaries (Hoenen and Kostova, 2015; Luo and Park, 2001; Tan and Litsschert, 1994) and firm performance in different conditions (Chakrabarti et al., 2011). Our research addresses the call for further research (see Teece, 2014) on MNEs’ dynamic capabilities, and particularly for research which examines the role of market and internal heterogeneity in determining those capabilities. Even though research on MNE innovation abounds (e.g., Mihalache, Jansen, van den Bosch, & Volberda, 2012), our analysis of the Ericsson case is one of the first attempts to consider the strategizing and innovation processes used by MNEs when responding to technological disruption. In contrast to prior MNE research that suggests that the environment–strategy alignment is of paramount importance for achieving competitive advantage (Ghoshal, 1987;

Morrison and Roth, 1992; Schleimer and Pedersen, 2013) our model of MNEs' responses to disruption tries to account for the complexities caused by divergent and sometimes contradictory customer demands. Our findings highlight the implications of market heterogeneity for the adaptive responses of MNEs, in particular the importance of being able to handle misaligned strategies, structures, and organizational actions.

## **2.7 Managerial implications**

Our findings may provide important insights for those managers dealing with technological disruption in a heterogeneous market. Managers tend to believe that internal alignment is a core capability for enabling effective change. Our case study suggests that organizations may need to allow and support inconsistent and sometimes contradictory organizational strategies, structures, and activities in order to deal with complexity in the external environment. Ashby (1956) suggests that external complexity needs to be matched to internal complexity or, in his words, "only variety destroys variety". Our findings show what can happen when a firm responds to disruption in a heterogeneous market in ways that are complex to handle internally. In this situation, managers may find it beneficial to broaden their scope of experimentation and trials to include different and sometimes divergent directions. Le Breton-Miller and Miller (2015) suggest that firms need to overcome the vulnerabilities associated with resource alignment in a changing environment. Expanding the range of options and strategic flexibility can be achieved by experimentation in different directions. To deal with high levels of complexity and uncertainty managers may benefit from a wider cognitive variety – i.e., diverse mental templates for problem-solving, here used to deal with coexisting and contradictory interpretations of the market dynamics and corresponding agendas (Eisenhardt, Furr, and Bingham, 2010).

Accommodating a range of activities within the organization that are based on differing interpretations of the market dynamics is obviously costly, and without active involvement from senior managers may take organizational resources in different directions (Coen and Maritan, 2010). To ensure a successful response to disruptive technologies, senior managers need to combine the stressing of overarching changes (Smith, 2014) with monitoring, reassessment, and direction change when necessary (Eisenhardt et al., 2010).

However, such interventions are very complex and require senior leaders to handle inconsistent strategies so that they can discern when an intervention is necessary to ensure a successful adoption of disruptive technologies (Volberda, 2017); interruptions based on inappropriate assumptions may deprive the organization of important learning outcomes.

Failure to distinguish between the assumptions behind different types of experimental activity and evaluating fundamentally different experiments using common organizational systems and approaches, may lead to errors of omission and a preference for projects that are within the organization's comfort zone and in line with the preferences of their more important customers. Hence, in addition to providing slack, delegating authority, and accepting skunk works, it is important for firms to secure the organizational and managerial capabilities needed to deal with the various tensions we have discussed. In particular, firms need a variety of approaches to problem-solving and organizational systems that allow sufficiently diverse experimentation.

## **2.8 Limitations and future research**

Our research has its limitations, and it is worth taking a closer look, for example, at what makes some MNEs more successful than others at coping with disruption in a heterogeneous market. Our findings imply that organizations need to be both dynamic and flexible, and we therefore need to know how this can be achieved. At the micro-level, we found managerial capabilities such as cognitive variety to be quite important in enabling firms to navigate effectively between contradictory visions of the future and their consequences. Firm-level factors such as capacity for learning, governance structure, and incentive systems may also play different enabling roles in the complex and challenging process of change that we illuminated in this case. While using a single case study was appropriate for understanding the nature of these challenges and their consequences, a multiple case study setting or quantitative techniques might enable us to identify the drivers of success or failure in the context of MNEs dealing with technological disruption in a heterogeneous market. In this paper, we advocated the necessity and potential benefits of moving away from attempting to follow an aligned strategy for change or trying to ensure that organizational structures and activities are in keeping with such a strategy. Moreover, our findings concerning the

structural approaches to deal with disruption may also encourage other researchers to choose not to focus on either separation, integration, or vacillation (e.g., Birkinshaw, Zimmermann, and Raisch, 2016; O'Reilly and Tushman, 2013) but instead to examine more closely at how these different approaches might be used concurrently.

This study emphasized demand heterogeneity as a key factor affecting firms' responses to technological disruption. By studying Ericsson's response to Cloud technology, we uncovered the several tensions around the innovation processes that arose from demand heterogeneity and we examined the organizational implications of these tensions. A key finding of the study is that, when facing market heterogeneity, organizations need to manage internal misalignment rather than striving for a single contingent-fit approach. We hope that the insights of this study will stimulate further research on global organizations' responses to technological disruption.



## Chapter 3: Who is first to the Cloud?

### A microfoundational study of cross-country adoption of platform technology

**Abstract.** Although scholars have examined how incumbents adopt technology, we do have insufficient knowledge of how technology adoption works differently in different national contexts. Attempting to bridge the gap between international business and strategy research, we suggest that technology adoption depends on both micro (organizational absorptive capacity and managerial attention) and macro factors (i.e., formal and informal institutional environment) as well as on the interplay between them. This study tests a moderated mediation model on responses from a representative sample of telecommunications operators to Cloud technology. We find that the influence of organizational absorptive capacity on technology adoption becomes apparent partly through managerial attention. We also find that, for adoption of an innovative platform technology, a firm's absorptive capacity compensates for both a lack of quality in the country's regulatory system and national-level short-term orientation. Absorptive capacity is also particularly important in directing managerial attention to the new technology in countries with lower-quality regulatory systems and short-term orientation. We contribute to the cross-country technology adoption literature by highlighting how formal and informal institutions moderate the effects of organizational and managerial cognition on adoption of digital platform technologies.

**Keywords:** *Technology and innovation, absorptive capacity, managerial cognition, institutional context, multilevel analysis*



### **3 “Who goes first to the Cloud?”: A microfoundational study of cross-country adoption of platform technology**

#### **3.1 Introduction**

In a world of rapid technological advances, it is increasingly important to understand what drives firms' technological adoption. This is especially so during the “era of ferment in technology lifecycles” as in the early stage after a technological discontinuity there is an exponential rise of the number of technological opportunities that may have strategic impact on the future of incumbent (Sine and David, 2003; Tushman and Anderson, 1986).

Technology adoption is a topic of interest in both strategic management and international business research, albeit the two approach it from different perspectives. While strategy research suggests that technology adoption depends on organizational and managerial factors (e.g., Damanpour & Schneider, 2006; Gerstner, Konig, Enders, & Hambrick, 2013; Raffaelli, Glynn, & Tushman, 2019; Taylor & Helfat, 2009; Xue, Hitt, & Chen, 2011), international business research focuses primarily on the role of national factors in adoption (e.g., Galang, 2012; Vernon, 1966). Although each field makes important contributions, each provides only a partial understanding of technology adoption. This is because the factors that might influence technology adoption within one particular country can have different effects when considered in another country (Corredoira and McDermott, 2014; Doh et al., 2017; Khanna and Palepu, 1997). In the face of the digital revolution, firms cope with tensions as they deal with the inertness of national institutions and changing business requirements at the same time (Doh et al., 2017; Khanna and Palepu, 1997). As Coviello, Kano, and Liesch (2017) argue, to understand firms' decisions, one needs to consider both the macro context in which firms operate and other factors at micro level (Contractor et al., 2019; Foss and Pedersen, 2019; Hutzschenreuter et al., 2007; Jackson and Deeg, 2019). Thus, without considering the interplay between organizational and national factors, the understanding of what drives technology adoption remains limited.

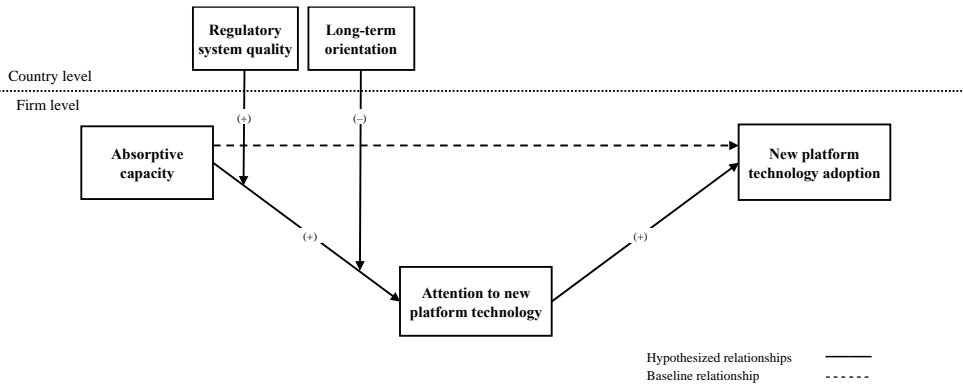
Using unique data of telecommunications operators worldwide, we study firms' decisions to adopt platform technology in the era of ferment when two conditions apply (1) there is no regulation relating specifically to the platform technology and (2) the ultimate

design of the technology and how to realize its potential is still unclear. This study makes two main theoretical contributions. First, we advance our understanding of technology adoption by bridging the gap between strategic management and international business research. We expand the discussion about digital platforms in an international context (Monaghan, Tippmann, & Coviello, 2019; Nambisan, Wright, & Feldman, 2019; Nambisan et al., 2019) by proposing that technology adoption depends on the interplay between micro factors and the macro context. We consider the macro context (Luo and Peng, 1999; Peng et al., 2009) and explicate the complex role of national regulatory systems (Blind, 2012) and national long-term orientation (Hofstede et al., 2010) to shed light on cross-country adoption of platform technology. In this way, we answer calls for investigating variation in firms' strategy, given "missing or malfunctioning institutions" (Doh et al., 2017: P. 296) and to offer a comprehensive multi-level understanding of tensions in new technology adoption (Eggers and Park, 2018).

Second, we provide a socio-cognitively rich model of platform technology adoption. We apply the attention-based view to examine the mediating role of top managers' technology specific cognitive action (i.e., their attention to platform technology) in the relationship between a path-dependent organizational cognitive capability (i.e., absorptive capacity) and new technology adoption. In particular, in our technology adoption model, we take account of the socio-cognitive context by including as moderators both the regulatory system and temporal orientation of various countries. We shed light on cross-country variations in how much attention managers give to platform technologies, taking into account that adopting these technologies needs a different macro-level logic too (Gawer and Phillips, 2013). We add to the literature by providing microfoundational insights (Eggers and Park, 2018; Foss and Pedersen, 2019; Li et al., 2019) into cross-country variations in how platform technologies are adopted. In this way, we offer new insights into how domestic technology adopters and multi-national technology providers can manage the effects of the institutional issues with a focus on the managerial and organizational cognition of the adopters.

We test a moderated mediation model by looking at the Cloud adoption of 89 domestic telecommunications operators representing 90.7 percent of the worldwide

**Figure 3.1– Conceptual model of cross-country adoption of new platform technology**



population. The survey was conducted through Ericsson, a leading provider of wireless telecommunications infrastructure, while the company was engaged in provision of new Cloud-based solutions to its clients. This enabled a high level of reliability and validity in measuring key variables of our study. Cloud is a platform technology that can have global strategic implications (Li et al., 2019; Nambisan, Zahra, et al., 2019) and requires complex organizational cognition for adoption (Nambisan, Lyytinen, Majchrzak, & Song, 2017; Shepherd, McMullen, & Ocasio, 2017).

### 3.2 Theoretical background and hypotheses development

In Figure 3.1, we present the conceptual model used in this research. We elaborate on the concepts in the model and hypothesize about the relationships between them in this section.

#### 3.2.1 Microfoundations of platform technology adoption

Platforms are often architectural innovations. In platforms, technologies that are typically bundled together are separated out into their various parts, which then tend to become interchangeable (Gawer and Cusumano, 2008). By adopting Cloud as a platform technology,

telecommunications operators can create leverage by opening up existing technologies to a network of complementors (Thomas et al., 2014).

Absorptive capacity, defined as the ability of a firm to identify, integrate, and apply new knowledge (Cohen and Levinthal, 1990), plays an enabling, motivating, and self-sustaining role in the adoption of platform technologies. Firms with higher levels of absorptive capacity are able to reconfigure their existing knowledge components more efficiently (Teece and Al-Aali, 2011) and faster (Grant, 1996). This is especially so when the technological innovation being adopted is an architectural one (Van den Bosch et al., 1999) such as a platform (Helfat and Raubitschek, 2000). Absorptive capacity is particularly helpful for the adoption of new technology in the very early stages, when different designs of technology are competing for dominance and it is unclear which will eventually prevail. This period is sometimes referred to as ‘the era of ferment.’ (Anderson and Tushman, 1990). As a dynamic capability that is developed and cumulated over time (Zahra and George, 2002), absorptive capacity improves firms’ proactiveness by creating confidence in their ability to exploit the potential of new technology efficiently (Ireland et al., 2003), and it reduces not only market and technological uncertainty but also managers’ risk aversion (Eshima and Anderson, 2017). Firms that have higher levels of absorptive capacity will be more motivated to explore and experiment with new technologies, as they often set ambitious technological goals (Eggers and Kaul, 2018). As a result, they are also more agile (Teece, 2014) in using technological opportunities as they arise independent of their current performance (Cohen and Levinthal, 1990).

### **3.2.2 Absorptive capacity, managerial attention, and platform technology adoption**

Absorptive capacity improves firms’ industry foresight, enabling them to anticipate more quickly and accurately how the industry may develop in the future and to set appropriate expectations (Cohen and Levinthal, 1994; Nadkarni and Barr, 2008). Such foresight makes managers alert to new technologies (Ocasio, 1997), but to pay sustained attention to them, managers also need to stay mindful (Levinthal and Rerup, 2006). Firms with greater absorptive capacity have a higher (sometimes even excessive) number of routines, which form their organizational memory (Feldman and Pentland, 2003). The organization memory helps the firms process external information—for example, about new

technologies (Cohen and Levinthal, 1990). This quality makes top managers more alert (Weick, 1995) and attentive to the new technology and the changes that may be involved (Nadkarni and Barr, 2008). The existing (excessive) collection of capabilities facilitates experimenting and developing new processes and structures for new platform technology adoption. The developing organizational capabilities sustain top managers' focus of attention on the technology (Ocasio, 1997).

To sustain that focus, top managers need to develop entrepreneurial judgment (Foss and Klein, 2012) with regard to the technology, too. Higher levels of absorptive capacity imply that middle and line managers have the knowledge of existing technology architecture and components (Van den Bosch et al., 1999; Taylor and Helfat, 2009) and the expertise required for experimenting with the components of the technology to adopt a new architectural innovation (Cohen and Tripsas, 2018). Therefore, the middle and line managers are able and motivated to advocate adopting the platform technology, so top managers are more likely to form a favorable judgment about its potential (Wooldridge et al., 2008). Such judgments help them to sustain their attention on the new technology as an strategic issue and entrepreneurial opportunity to be captured (Shepherd et al., 2017). This is critical since top managers control organizational resource allocation specifically for the adoption of new platform technology (Hambrick, 2007; Hambrick and Mason, 1984). The combination of top managers' entrepreneurial judgment and sustained attention quicken the adoption of the new platform technology.

Absorptive capacity therefore helps firms to notice, engage with, and commit to a new platform technology (Miller and Chen, 1994). Consequently, top managers are more likely to make an earlier decision to invest in the technology. Thus, we hypothesize that:

*Hypothesis 1: Managerial attention to a platform technology mediates the positive relationship between organizational absorptive capacity and adoption of the technology.*

### **3.2.3 The moderating role of institutions in platform technology adoption**

We argued that organizational absorptive capacity drives platform technology adoption in the era of ferment by first directing and then sustaining managerial attention to the technology. For a platform technology such as Cloud, those who adopt the technology need—as platform leaders—to create an ecosystem of complementors in order to capture value from the platform (Gawer and Cusumano, 2008). To do so, they need to deal with existing institutions (Gawer and Phillips, 2013; Navis and Glynn, 2010). Given the specific importance of institutions for platform business models, we complement existing literature by studying formal and informal institutions: (i) regulatory systems and (ii) long-term orientation.

### **3.2.4 The moderating role of regulatory system quality**

Regulatory systems, i.e., national regulations and their enforcement processes and agents, exist to maintain a balance between the competing interests of community members (Brownsword, 2019). As idiosyncratic characteristics of countries, regulatory systems set the strategic context for business decisions (Arregle et al., 2013; Baumol et al., 2007). For instance, what regulators do not regard as legitimate can differ from location to location (Suddaby et al., 2017). Further, the variety of the quality of regulatory systems has also a bearing on firms' technological decisions (Baumol et al., 2007).

A strong regulatory system, because of higher government efficiency in legislation and developing regulations, creates certainty and predictability about new developments and helps to contain their risks. It should help firms to take advantage of technologies but it can also control their potential downsides (Blind, 2012). In the early stages, however, architectural innovations often go unrecognized (Henderson and Clark, 1990), so attract too little attention from regulators. In other words, technology-specific rules are often made later when the technology starts to be taken up by a wider, more general audience (Brownsword, 2019). Therefore, until the specific system of regulation for a new technology is developed, business is governed by the regulatory system that has been customized to the existing technology (Ernkvist, 2015; Streeck and Thelen, 2005). This 'pacing problem' (Marchant, 2011) creates a 'regulatory disconnect' during which firms not

only have to deal with technological issues, but also they should take care of societal and legal aspects of the technology adoption (Brownsword, 2019; Moses, 2013).

The decision to adapt to technological change has inherent uncertainties, and a regulatory system that is unpredictable, ineffective, or inferior regulatory can create even greater uncertainty (K. D. Miller, 1993). A weak regulatory system can limit the positive effect of absorptive capacity on managerial attention to new technology. The degree to which absorptive capacity feeds into managerial attention is dependent on the salience of the issue, here the adoption of platform technology, which determines whether and how managers respond to it (Ocasio, 1997). Incumbents with greater absorptive capacity develop country-specific knowledge and capabilities by applying cognitive structures, i.e., set of heuristics, on their accumulated knowledge and experience (Bingham et al., 2007; Chittoor et al., 2015). For instance, firms with higher levels of absorptive capacity are able to anticipate more precisely the risks and probable frictions associated with adopting a new technology and the regulatory system (Berghman et al., 2013). The weak regulatory system calls into play organizational heuristics that work against attention being given to new technologies at an early stage and means that adaptation is postponed to a later stage when the level of uncertainty is more acceptable (Amit and Schoemaker, 1993; Schoemaker, 1990).

There is also another way in which weak regulatory systems can affect absorptive capacity-attention relationship: influencing the prospect of ecosystem development. Weak regulatory systems discourage entrepreneurial activities, therefore decrease the chance that an ecosystem of complementors develop around a platform technology soon (Baumol et al., 2007). Moreover, weak regulatory systems, which are generally incapable of containing interfirm contractual problems due to the poor quality of regulations, relative lack of rule of law or inefficient government, are even less efficient for managing specific conflicts that arise in platform ecosystems (Brownsword, 2019). This is especially important as realizing the potential of a platform technology is heavily dependent on a multitude of complex interfirm collaborations, needed to create value (Gawer and Cusumano, 2013), and these are prone to different tensions, especially in the early stages of developing a platform ecosystem. In addition, a critical success factor for platform ecosystems to grow and thrive

is an intellectual property right protection system (Teece, 1986, 2018). A platform friendly intellectual property right protection system is not embedded in regulatory systems that are not designed for digital ecosystem environments (Moses, 2013). Consequently, firms find it difficult to forecast how profitable their technological investments will be because of the potentially high levels of transactional complexity resulting from the regulatory system. The uncertainty about the feasibility of the technological investment can make pursuing opportunities associated with the platform technology less desirable in technology evaluation inputs to the managers (Ren and Guo, 2011; Shepherd et al., 2017). The issue of adoption could therefore disappear temporarily from the firm's strategic agenda.

All in all, we argue that the quality of regulatory systems at the country level facilitate the adoption of new technology and we thus hypothesize that:

*Hypothesis 2: Regulatory system quality moderates the indirect relationship between absorptive capacity and new platform technology adoption in such a way that the indirect effect through managerial attention is stronger in countries with regulatory systems of higher quality.*

### **3.2.5 The moderating role of long-term orientation**

The absorptive capacity and the national culture of the technology adopter have an interaction effect in the process of technology adoption across nations (Kedia and Bhagat, 1988). Culture is an informal institution (North, 1990) that, according to Lachmann (2007), indicates and coordinates how collective members behave (Foss et al., 2019). The choices a firm makes regarding when to invest in new technologies are critical (Levinthal and March, 1993), and those choices are specifically affected by the national culture (Foss et al., 2019; Lin et al., 2019) specifically its long-term orientation. Adopting platform technologies requires incumbents to transform both the organization and their business model, which makes it a long-term project (Agarwal and Helfat, 2009).

Attention is a result of two different cognitive activities: top-down and bottom-up processes. National culture forms managers' top-down cognitive process by creating a value system that controls the managers' unconscious attention. Absorptive capacity feeds into the

bottom-up process, i.e., conscious attention, by creating new cognitive frames upon new information. The combined effect of the two processes determines if and how managers attend to business issues (Shepherd et al., 2017). Organizations with strong absorptive capacity can build hype for emerging technology (Wales et al., 2013) that can stimulate “here-and-now” reaction of managers. When their top-down attention mechanism are situated in long-term orientated cultures, managers are more likely to refuse such behavior (Nevins et al., 2007). Thus, in long-term oriented cultures, the tendency toward avoiding rush in strategy-making moderates the increasing effect of absorptive capacity on attention to new technology.

For firms with low absorptive capacity, long-term oriented culture leverage the marginal effect of the absorptive capacity on the managers’ attention. This occurs as the top-down cognitive mechanism driven by long-term oriented value systems is sensitive to environmental cues about technological opportunities that influence firms’ long-term survival (Shepherd et al., 2017). Cues that managers receive from other source, such as technology providers’ technology diffusion programs (Rogers, 1995), can trigger their attention even if their organization is incapable of sending the cue. As a result, in long-term orientated culture, low levels of absorptive capacity can moderately increase top managers’ attention to new technology, as managers are more receptive to the cues for future-oriented investments (Flammer and Bansal, 2017).

In short-term oriented cultures, the top-down attention mechanism is not sensitive to cues about investments, which pay off far in the future, such as platform technology adoption. This may result in decreased managerial attention to the signals that poor absorptive capacity generates (Marginson and McAulay, 2008; Souder and Bromiley, 2012). This culture reinforces “here-and-now” behavior, therefore, higher levels of absorptive capacity can sharply increase managers’ attention to new technology. Organizations with higher levels of absorptive capacity tend to be (too) optimistic about emerging technology. The optimism causes a discounted perception of the time remained until a technological investment yields profit (Carstensen et al., 1999; Puri and Robinson, 2007; Zauberaman et al., 2009), hence invokes immediate managerial attention to the new technology (Nevins et al., 2007).

In sum, long-term orientation moderates the relationship between organizational absorptive capacity and managerial attention to platform technology. We, therefore, hypothesize that:

*Hypothesis 3: Long-term orientation moderates the indirect relationship between absorptive capacity and new platform technology adoption in such a way that the indirect effect through managerial attention is weaker in countries with higher levels of long-term orientation.*

### **3.3 Method and data**

Cloud technology has been a disruptive force in the telecommunication industry, setting new standards for business efficiency and novelty. It opened up new horizons for incumbents as well as challengers. In November 2014, when we started collecting survey data, Cloud technology was not fully fledged, specifically concerning software-defined networking and network function virtualization. The industry, technology development stage, and worldwide diffusion of the technology made Cloud a suitable and revealing case for studying adoption of a platform technology at a point in time when uncertainty about the technology was considerably high.

#### **3.3.1 Sample**

We draw our sample from Ericsson's worldwide customers. Ericsson is a leading global supplier of telecommunications technologies, and we tapped into its network to collect unique global data on Cloud technology adoption worldwide. We selected informants, i.e., Ericsson account managers, and invited them to answer our questions. The account managers had extensive knowledge about Cloud technology products and also knew and also knew what kind of technological solutions were asked for by the accounts since they had direct connections with the top, middle, and line managers in those firms (Shi et al., 2010). The account managers had, on average, more than four years of tenure in working on those accounts. We invited more than one respondent whenever it was possible (for larger accounts to which more account managers were assigned) and used the average of their

responses for our analysis (Kumar et al., 1993). Ericsson's customers in this study are 138 telecommunication network operators from different regions in the world.

The survey was open for 24 days. We received data about 118 out of 138 accounts. In this process, we focused on those that operated only in one country so that we could study country-level effects. We kept data on customers that had a big subscription base and owned their own network; smaller/virtual firms were not the object of this study as they did not own any infrastructure that would need to be changed. In the end, 89 different firms from 79 countries fitted the criteria of this study.

### 3.3.2 Measurement

In this study we used existing and new multi-item scales. We tested the reliability of the scales and reported in Table 3.1 where applicable.

**Dependent variable.** Previous research in technology adoption employed either a dichotomous scale of early or late adoption (Garrison, 2009) or one in which the adoption is divided into three phases: initiation, adoption decision, and implementation (Damanpour and Schneider, 2006). To measure the dependent variable, i.e., the Cloud technology adoption progress, we used a five-point Likert type scale for adoption: 'no activity,' 'some speculations [about the technology],' 'preliminary plans,' 'concrete plans,' and 'already in deployment phase.' For a more accurate rating, we asked informants to indicate the extent to which the clients had progressed in adoption of an independent software, which enables the clients to use operate Cloud technologies, in year 2014. We did this because some of the firms might have plans to adopt Cloud products from other technology providers.

**Independent variables.** We used established scales for *absorptive capacity* to measure the *general* technological capability of the telecommunication operators. According to Volberda, Foss, and Lyles (2010), absorptive capacity can be measured indirectly by evaluating proxies such as the number of scientists working in R&D departments. We used a direct measurement method by adjusting what Schleimer and Pedersen (2013) suggested as a direct scale. In our questionnaire, we asked informants to answer the following question: 'Compared to other service providers and direct competitors, please evaluate [the company

of interest] in terms of the following capabilities.’ They were then presented with six capabilities to rate: recognizing the consequences of market and technological changes for their business; in-house expertise in understanding the new technologies; ability to customize off-the-shelf technologies for applications; adequate technical skills to operate new technology applications in-house; ability to fine-tune components of advanced technical solutions to make them work when needed. Each of these items was rated on a seven-point Likert-type scale, with 1 indicating ‘little or no capability,’ 4 representing ‘to some extent capable,’ and 7 indicating ‘possesses superior capabilities.’

Although managerial cognition is hard to measure (Cho and Hambrick, 2006), researchers mainly rely on managers’ words in their internal and external communications to measure their attention. For instance, self-report (e.g., Bouquet & Birkinshaw, 2011) and textual content analysis (e.g. D’Aveni & MacMillan, 1990) are often used to measure the attention. In this research, we used the communication-based method. We measured managerial *attention* using the scale developed by Khanagha, Volberda, and Oshri (2017). We also added two more questions about the companies’ progress in hiring technology and business consultants for Cloud technology. With these two extra questions we extended the original scale’s potential to capture the sustained managerial attention required to take advantage of complex opportunities (Ocasio, 2011; Shepherd et al., 2017). To measure managerial attention in year 2014, we used a seven-point Likert-type scale, ranging from 1 (“to a low extent”) to 7 (“to a large extent”). Our scale included questions about (1) the frequency with which managers referred to Cloud technology and (2) the degree of emphasis they placed on it in their internal and external communications. It also included questions about (3) if and to what extent they use external advisors help on Cloud technology adoption and (4) Cloud business models adoption.

We used secondary data to measure national *regulatory system quality*. We employed three items from a recognized scale for measuring governance (Kaufmann et al., 1999, 2009). We selected the items that addressed our hypothesized concept: rule of law, government effectiveness, and regulation quality. We calculated the average of the three items to measure national regulatory system soundness. Then we created a dummy variable

(Canela et al., 2019) to indicate whether a country scored above average (1 = strong regulatory system) or below average (0 = weak regulatory system).

Long-term orientation is a commonly used dimension of culture in studies of cross-country differences in activities (Legohérel et al., 2009). For long-term orientation, we used a related item from Hofstede's survey of national values, which captures how nations maintain links to the past while embracing the present and the future (Hofstede et al., 2010). We generated a dummy variable (Canela et al., 2019) to indicate whether a nation scored above average (long-term orientation = 1) or below average (short-term orientation = 0). Another available dataset containing data about the temporal orientation of the nations is the GLOBE (House et al., 2002). We selected Hofstede's dataset because there was a greater overlap between the countries included in it and our survey data.

**Control variables.** We controlled for the effect of the overall economic health of countries using the GDP per capita and the GDP growth rate (Galang, 2012) for the year 2014. We calculated the rate based on data from the World Bank databank (World Bank Group, 2019). We also controlled for the effects of culture as an informal by testing the remaining dimensions of Culture from Hofstede's survey of national values: power distance, individualism, masculinity, uncertainty avoidance, and indulgence. We controlled for the effects of remaining dimensions of governance from the survey by Kaufmann et al. (2009), i.e., political stability, control of corruption, and voice and accountability. We also used data on level of the connectedness of countries to control for the effects of globalization on the platform technology adoption (Ghemawat and Altman, 2014).

Since firm *size* matters in the sense of the resources available to a firm and its flexibility to engage in adoption, the natural logarithm of the firm's subscriber base was used in our research model as an indicator of the size of each telecom operator (Jansen et al., 2005). We collected data on the size of the telecommunications operators in our research from their last available annual report, i.e., the report for the year 2013. We also controlled for the *autonomy (strategic independence)* of the firm from its global headquarters, especially regarding decisions on technology. The question we asked of account managers was 'Does [the company of interest] have strategic independence in making decisions (e.g.,

concerning long-term plans, the evolution of the network, usage of new technologies)?" We used a seven-point Likert-type scale: The answers ranged from "1 - No, another organization, for example, a holding company, makes such decisions" and "7 - Yes, [the company of interest] has complete independence for making its own strategic decisions." We controlled for the effects of firms' growth strategies. For this, we asked informants if and to what extent the following items indicate the firms' current strategies: "preserving current markets", "entering new markets", "reducing time-to-market", and "developing new revenue streams". We used a Likert-type scale ranging from 1 ("to a low extent") to 7 ("to a large extent"). We also collected data on the technology sourcing strategy (Steensma and Corley, 2000) and the growth strategy (Ansoff, 1957) of the firms. We asked the account managers about if the firms had (1) revenue sharing and (2) joint investments with the technology provider. These two together with 'buying' were the options of technology sourcing in the industry. The questions we asked to collect data on strategy of the firms were if they have general plans to expand to new markets, create new revenue streams, reduce time-to-market, and preserve their existing markets. We also asked questions about financial plans of the firms on managing their CAPEX and OPEX. We used a seven-point Likert-type scale to measure business model and strategy of the firms.

**CMV.** We followed the recommended instructions for survey data collection and treatment (Chang et al., 2010). We designed different types of scales and used reverse rating scales. We had the questionnaire reviewed by experts during the design phase, and provided anonymity for respondents. We also compared data we received from early respondents and laggards to see if there was any significant dependency (Rogelberg and Stanton, 2007). We observed no statistically significant difference between the opinions of late and early respondents. We also used data from existing datasets that are used in international studies to test our hypotheses: Ghemawat and Altman (2014), Hofstede et al., (2010), Kaufmann et al. (2009), and The World Bank Group (2019). In addition to our unique cross-country survey data and the existing datasets, we were inspired by information we obtained from interviews with managers from Ericsson and operators from different regions. Applying a triangulation strategy (Creswell, 2009), we validated our findings by identifying evidence in the interview data that corroborated the results of our survey data analysis. We also

presented the results of the study to Ericsson and the operators' managers for cross-validation of the results. They offer new evidence that confirmed the results.

The Herman's single factor test did not indicate a single emerging factor. We assessed factor loadings, composite reliability, and average variance extracted. The results supported the validity of the measurement. The results of a confirmatory factor analysis suggested that our measurement model is acceptable with  $\chi^2 /df = 1.29$ , CFI=0.98, TLI=0.97, RMSEA=0.06, and SRMR=0.07 (Hu and Bentler, 1999). We test a complex model of moderated mediation that makes biased results, due to a common method variance, unlikely, specifically because of the existence of interaction effects. "Finding significant interaction effects despite the influence of CMV in the data set should be taken as strong evidence that an interaction effect exists" (Siemsen, Roth, & Oliveira, 2010: p. 470). Thus, we have evidence that common method variance is not a major concern in this research.

### **3.4 Analysis and results**

In Table 3.1, we present descriptive statistics and correlations of the variables of this research. The largest variance inflation factor across all the regression models is below 5. We tested our hypotheses with hierarchical regression analysis considering the moderating effect between absorptive capacity and managerial attention to new platform technology. In Hypotheses 2 and 3 we articulated the moderated mediation relationships. To test them, we followed what is suggested in the literature (Preacher et al., 2007). We present the results in Table 3.2. All of the models are statistically significant ( $p < 0.001$ ). We report the detail of the conditional indirect effect of absorptive capacity on the new platform technology adoption (Hayes, 2017) in Table 3.3.

Hypothesis 1 states that absorptive capacity influences new platform technology adoption partially by directing managers' attention toward and sustaining their focus on the technology. We followed the method suggested by Baron and Kenny (1986) to test the mediation model. Thus, we first test if there is a statistically significant relationship between absorptive capacity and attention (Table 3.2, Model 2 and Model 4), then absorptive capacity and new platform technology adoption (Table 3.2, Model 6). The tested relationships were

statistically significant. Afterward, we tested the model with attention as mediator (Table 3.2, Model 9). These results together reject the null hypothesis and confirm the existence of the hypothesized (partial) mediation relationship.

In Hypothesis 2, we argue that the quality of regulatory system will have a moderating effect on the relationship between absorptive capacity and managerial attention. Model 4 indicates that regulatory system quality has a non-significant moderating effect ( $b=-0.02$ ,  $SE=0.10$ ,  $p=0.824$ ); however, Johnson-Neyman analysis and bootstrapping analysis show a statistically significant moderating effect in the countries with a weak regulatory system. The confidence intervals of bootstrapped analysis of conditional indirect effect includes zero only for countries with a strong regulatory system (Hayes, 2017). Our analysis confirms the moderating effect for a part of the sample but in the opposite direction of our hypothesis. Thus, Hypothesis 2 is not confirmed (see Table 3.3, Figure 2a). In Hypothesis 3, we predicted that a country's long-term orientation would have a negative moderating effect on the relationship between absorptive capacity and managerial attention. Model 4 confirms the moderating effect ( $b=-0.01$ ,  $SE=0.00$ ,  $p=0.004$ ) (see Table 3.3, Figure 2b). The confidence intervals of conditional mediation index for culture with 10000 bootstrap samples does not include zero. Thus, Hypothesis 3 is confirmed. We write about the results in detail in the discussion section.

**Robustness test.** The results of structural equation modeling of the hypothesized relationship confirm the results reported above. We ran the process model with data of a six-item scale of absorptive capacity instead of the four-item (one potential and three realized absorptive capacity which was based on the results of CFA). The results of this model were consistent with those of the original model. We also tested models with each moderator separately because of the correlation ( $r=0.364$ ,  $p<0.05$ ) between them. The results for the hypothesized effects remained comparable in terms of direction and significance.

**Table 3.1– Descriptive statistics and correlation coefficients**

No. Variable	N	Min.	Max.	Mean	S.d.	Correlation coefficients																				
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1 GDP Growth	89	-0.10	0.30	0.02	0.06	-																				
2 GDP PPP	89	1291.75	101297.58	28569.46	20457.68	-.212 <sup>+</sup>	-																			
3 Political Stability	89	-2.48	1.47	-0.02	0.97	-0.192	.640 <sup>**</sup>	-																		
4 Voice and Accountability	89	-1.88	1.68	0.24	1.03	-.217 <sup>+</sup>	.433 <sup>**</sup>	.747 <sup>**</sup>	-																	
5 Control of Corruption	89	-1.44	2.25	0.31	1.11	-.256 <sup>+</sup>	.743 <sup>**</sup>	.813 <sup>**</sup>	.772 <sup>**</sup>	-																
6 Global Connectedness	89	18.17	91.28	55.19	15.81	-0.074	.672 <sup>**</sup>	.462 <sup>**</sup>	.496 <sup>**</sup>	.691 <sup>**</sup>	-															
7 Power distance	83	22.00	104.00	62.19	19.16	0.182	-.538 <sup>**</sup>	-.565 <sup>**</sup>	-.633 <sup>**</sup>	-.725 <sup>**</sup>	-.473 <sup>**</sup>	-														
8 Individualism	83	12.00	91.00	48.75	23.89	-.269 <sup>+</sup>	.636 <sup>**</sup>	.628 <sup>**</sup>	.657 <sup>**</sup>	.743 <sup>**</sup>	.604 <sup>**</sup>	.697 <sup>**</sup>	-													
9 Masculinity	83	5.00	110.00	52.42	18.04	0.168	-0.050	-0.019	-0.085	-0.171	-0.081	.253 <sup>+</sup>	0.065	-												
10 Uncertainty avoidance	83	29.00	112.00	64.14	20.09	-0.150	-0.070	-0.085	0.003	-0.136	-0.093	.265 <sup>+</sup>	-.318 <sup>**</sup>	0.003	-											
11 Indulgence	85	19.00	100.00	51.51	19.96	0.088	0.119	0.142	.324 <sup>**</sup>	.262 <sup>+</sup>	0.062	-.494 <sup>**</sup>	0.174	-0.197	-0.138	-										
12 Log (Subscription base)	89	4.90	8.88	6.97	0.74	-0.015	-0.110	-0.119	-0.108	-0.113	-0.143	-0.004	-0.005	-0.042	-.228 <sup>+</sup>	-0.076	-									
13 Strategist independence from HQ	89	1.00	7.00	4.57	1.90	-0.161	.349 <sup>**</sup>	0.148	0.159	.279 <sup>**</sup>	.370 <sup>**</sup>	-.259 <sup>+</sup>	.248 <sup>+</sup>	-0.107	-0.063	0.092	0.041	-								
14 Revenue sharing with technology provider	89	-75.00	8.00	0.04	14.06	-.369 <sup>**</sup>	0.159	0.072	0.100	0.201	0.154	-0.087	.228 <sup>+</sup>	-0.033	-0.123	-0.166	0.059	.267 <sup>+</sup>	-							
15 Joint investment with technology provider	88	1.00	7.00	2.44	1.92	-0.125	0.025	-0.079	-0.052	-0.050	-0.009	-0.087	0.070	0.097	0.056	-0.090	0.191	0.041	0.106	-						
16 Growth strategy	89	0.00	7.00	4.69	1.38	.251 <sup>+</sup>	-.268 <sup>+</sup>	-0.151	-0.110	-.218 <sup>+</sup>	-0.166	0.075	-0.158	0.143	-0.182	0.075	-0.010	-0.072	-0.150	-0.044	[0.72]					
17 Financial strategy	89	0.00	7.00	5.40	1.80	0.003	-0.175	-0.082	0.002	-0.116	-0.055	-0.012	-0.071	-0.108	-0.033	0.010	-0.055	0.020	-0.052	-0.024	.439 <sup>**</sup>	-				
18 Attention to new platform technology (ATTN)	89	1.00	7.00	4.04	1.43	0.017	.225 <sup>+</sup>	0.183	0.106	0.124	0.097	-0.159	0.123	0.091	-0.057	0.013	0.186	0.122	-0.084	-0.074	.351 <sup>+</sup>	.238 <sup>+</sup>	[0.74]			
19 Absorptive capacity (ACAP)	89	1.00	7.00	4.03	1.42	0.102	0.131	0.111	0.046	0.085	0.064	0.034	0.010	0.118	0.192	-0.009	0.054	0.150	-0.039	0.024	0.108	-0.023	.206 <sup>+</sup>	[0.89]		
20 Regulatory system quality (RSQ)	89	-1.65	1.96	0.43	0.99	-.263 <sup>+</sup>	.727 <sup>**</sup>	.819 <sup>**</sup>	.808 <sup>**</sup>	.967 <sup>**</sup>	.697 <sup>**</sup>	-.669 <sup>**</sup>	.734 <sup>**</sup>	-0.098	-0.119	0.188	-0.104	.256 <sup>+</sup>	.218 <sup>+</sup>	-0.044	-0.199	-0.085	0.151	0.107	[0.97]	
21 Long-term orientation (LTO)	89	0.74	100.00	39.78	23.86	-0.038	.259 <sup>+</sup>	.363 <sup>**</sup>	.297 <sup>**</sup>	.296 <sup>**</sup>	.433 <sup>**</sup>	-0.070	0.215	0.127	0.027	-.405 <sup>**</sup>	.213 <sup>+</sup>	0.097	0.160	-0.037	-0.087	-0.103	0.018	0.089	.364 <sup>**</sup>	-
22 New platform technology adoption (NPTA)	89	0.00	5.00	2.60	1.05	0.070	0.204	.270 <sup>+</sup>	.240 <sup>+</sup>	0.164	0.149	-0.148	0.153	-0.010	-0.075	0.116	0.058	0.084	-0.150	-0.051	0.139	0.088	.234 <sup>+</sup>	0.237	0.189	0.045
Valid N list wise before imputation: 82; *. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed). Cronbach's alpha is on the diagonal where applicable.																										

Valid N list wise before imputation: 82; \*. Correlation is significant at the 0.05 level (2-tailed). \*\*. Correlation is significant at the 0.01 level (2-tailed). Cronbach's alpha is on the diagonal where applicable.

Table 3.2– Hierarchical regression analysis of new platform technology adoption

Variables	ACAP → ATTN												ACAP → ATTN → NPTA																	
	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7			Model 8			Model 9					
	b	SE	p	b	SE	p	b	SE	p	b	SE	p	b	SE	p	b	SE	p	b	SE	p	b	SE	p	b	SE	p			
<u>Control variables</u>																														
(Constant)	-3.49	2.69	0.199	-2.68	2.53	0.293	-3.21	2.51	0.207	-5.42	2.46	0.032	0.77	2.25	0.73	1.20	2.23	0.581	2.32	1.98	0.247	2.28	2.04	0.268	0.71	2.14	0.741			
GDP growth	-1.23	3.04	0.687	-2.13	2.85	0.457	-1.87	2.83	0.512	-3.28	2.70	0.230	0.55	2.53	0.829	0.016	2.520	0.985	0.92	2.22	0.681	0.92	2.28	0.686	-0.03	2.29	0.989			
GDP PPP	0.00	0.00	0.005	0.00	0.00	0.006	0.00	0.00	0.008	0.00	0.00	0.001	0.00	0.00	0.195	0.000	0.000	0.247	0.00	0.00	0.861	0.00	0.00	0.873	0.00	0.00	0.601			
Political stability	-0.01	0.32	0.980	-0.06	0.30	0.842	0.06	0.30	0.839	0.02	0.28	0.936	0.43	0.26	0.104	-0.069	0.577	0.120	0.43	0.23	0.066	0.44	0.24	0.073	0.42	0.24	0.080			
Voice and accountability	0.18	0.28	0.531	0.20	0.26	0.442	0.34	0.30	0.265	0.44	0.29	0.131	0.29	0.23	0.217	0.405	0.260	0.185	0.22	0.21	0.279	0.23	0.24	0.337	0.33	0.25	0.187			
Control of corruption	-0.13	0.38	0.739	-0.22	0.35	0.541	-0.19	0.59	0.752	-0.20	0.55	0.712	-0.57	0.31	0.076	0.322	0.262	0.049	-0.53	0.28	0.059	-0.52	0.47	0.269	-0.55	0.46	0.240			
Global connectedness	0.00	0.01	0.780	0.00	0.01	0.789	0.01	0.02	0.549	0.01	0.01	0.462	0.01	0.01	0.628	-0.568	0.521	0.606	0.01	0.01	0.472	0.01	0.01	0.492	0.01	0.01	0.402			
Power distance	-0.01	0.01	0.384	-0.02	0.01	0.199	-0.02	0.01	0.151	-0.02	0.01	0.233	0.00	0.01	0.735	0.007	0.012	0.908	0.01	0.01	0.426	0.01	0.01	0.447	0.01	0.01	0.396			
Individualism	-0.01	0.01	0.251	-0.01	0.01	0.217	-0.02	0.01	0.101	-0.02	0.01	0.040	0.00	0.01	0.994	0.001	0.012	0.998	0.01	0.01	0.518	0.01	0.01	0.571	0.00	0.01	0.860			
Masculinity	0.01	0.01	0.164	0.01	0.01	0.181	0.01	0.01	0.110	0.01	0.01	0.092	0.00	0.01	0.589	0.000	0.010	0.517	-0.01	0.01	0.160	-0.01	0.01	0.194	-0.01	0.01	0.249			
Uncertainty avoidance	0.01	0.01	0.465	0.00	0.01	0.959	0.00	0.01	0.999	0.00	0.01	0.736	0.00	0.01	0.548	-0.005	0.008	0.270	-0.01	0.01	0.226	-0.01	0.01	0.242	-0.01	0.01	0.157			
Indulgence	-0.01	0.01	0.506	-0.01	0.01	0.467	-0.02	0.01	0.127	-0.01	0.01	0.269	0.00	0.01	0.651	-0.009	0.008	0.650	0.01	0.01	0.376	0.01	0.01	0.494	0.01	0.01	0.390			
Log (Subscription base)	0.68	0.21	0.002	0.60	0.20	0.004	0.77	0.22	0.001	0.59	0.21	0.008	0.13	0.18	0.462	0.003	0.008	0.619	-0.16	0.17	0.353	-0.14	0.19	0.457	-0.18	0.19	0.341			
Strategic independence from HQ	0.05	0.09	0.575	0.00	0.08	0.993	-0.01	0.08	0.931	0.03	0.08	0.686	-0.01	0.07	0.880	0.090	0.178	0.603	-0.04	0.06	0.556	-0.04	0.06	0.561	-0.02	0.06	0.797			
Revenue sharing with technology provider	0.00	0.01	0.775	0.01	0.01	0.686	0.01	0.01	0.556	0.01	0.01	0.402	-0.02	0.01	0.189	-0.038	0.072	0.199	-0.02	0.01	0.100	-0.02	0.01	0.114	-0.01	0.01	0.176			
Joint investment with technology provider	-0.16	0.08	0.049	-0.17	0.08	0.027	-0.19	0.08	0.017	-0.19	0.07	0.009	-0.01	0.07	0.913	-0.015	0.011	0.852	0.06	0.06	0.349	0.06	0.06	0.375	0.04	0.06	0.568			
Growth strategy	0.40	0.13	0.004	0.28	0.13	0.032	0.30	0.13	0.021	0.37	0.13	0.004	0.05	0.11	0.632	-0.013	0.067	0.937	-0.13	0.10	0.235	-0.12	0.11	0.255	-0.05	0.11	0.627			
Financial strategy	0.17	0.09	0.071	0.19	0.09	0.030	0.17	0.09	0.064	0.17	0.08	0.054	0.04	0.08	0.621	-0.010	0.114	0.504	-0.03	0.07	0.693	-0.03	0.07	0.695	-0.02	0.07	0.825			
<u>Independent variables</u>																														
ATTN																			0.41	0.10	0.000	0.41	0.10	0.000	0.32	0.11	0.005			
ACAP				0.33	0.10	0.002	0.35	0.10	0.001	0.93	0.21	0.000				0.052	0.077	0.046	0.05	0.09	0.583	0.05	0.09	0.582	0.41	0.20	0.044			
RSQ							-0.12	0.65	0.850	-0.22	0.70	0.759										-0.01	0.52	0.979	-0.04	0.59	0.942			
LTO							-0.02	0.01	0.063	0.05	0.02	0.034										0.00	0.01	0.900	0.04	0.02	0.087			
<u>Moderation effects</u>																														
ACAP x RSQ											-0.02	0.10	0.824												-0.02	0.09	0.784			
ACAP x LTO											-0.01	0.00	0.004												-0.01	0.00	0.064			
R Square	0.41			0.50			0.52			0.59			0.23			0.27			0.43			0.43			0.47					
Adjusted R Square	0.26			0.35			0.37			0.44			0.21			0.07			0.26			0.24			0.26					
F	2.64			3.43			3.34			3.92			1.10			1.32			2.50			2.19			2.25					

Numbers in **bold** indicate statistically significant values at  $p < 0.05$ .

**Table 3.3– Conditional indirect effects of absorptive capacity on new platform technology adoption**

		Indirect effect				
		ACAP → ATTN → NPTA				
Moderator		Effect	Bootstrap SE	Bootstrap Confidence Intervals		
RSQ	LTO			LL	UL	
16 <sup>th</sup> , 50 <sup>th</sup> , and 84 <sup>th</sup> percentile	-0.47	20.28	<b>0.21</b>	0.11	<b>0.04</b>	<b>0.45</b>
		33.5	<b>0.14</b>	0.08	<b>0.02</b>	<b>0.33</b>
		69.16	-0.03	0.09	-0.24	0.13
	0.32	20.28	<b>0.20</b>	0.11	<b>0.04</b>	<b>0.45</b>
		33.5	<b>0.14</b>	0.07	<b>0.03</b>	<b>0.32</b>
		69.16	-0.03	0.08	-0.20	0.12
	1.78	20.28	<b>0.20</b>	0.13	<b>0.02</b>	<b>0.53</b>
		33.5	<b>0.13</b>	0.10	<b>0.01</b>	<b>0.39</b>
		69.16	-0.04	0.08	-0.19	0.15

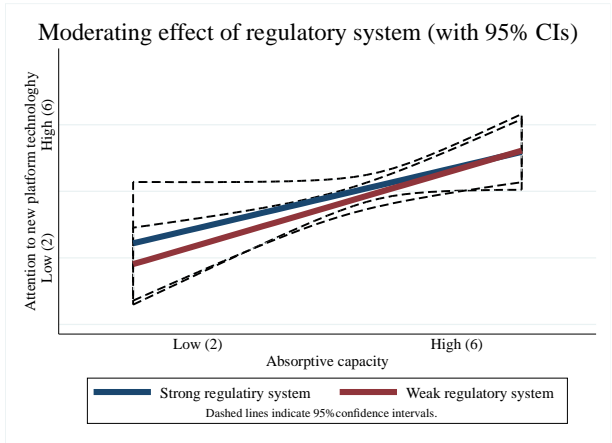
\*Number of bootstrap samples = 10,000; Level of confidence intervals = 95%

### 3.5 Discussion

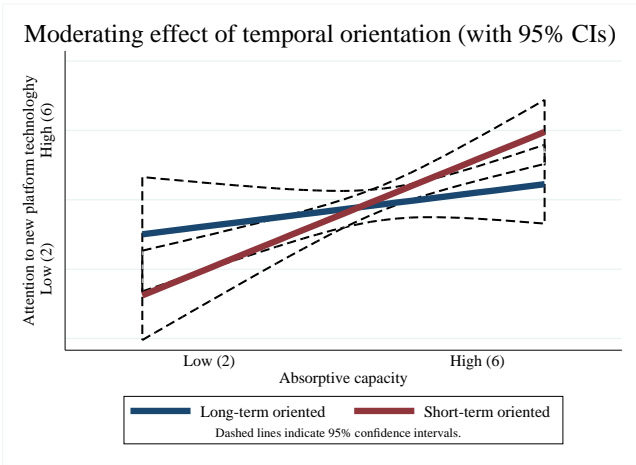
he question of why firms vary in their adoption of new technology has long been on business researchers’ agenda, and the question has been addressed from a number of different perspectives. Organizational and managerial cognition theorists have contributed to understanding the variation by conducting qualitative and quantitative studies (e.g., Tripsas & Gavetti, 2000; Cho & Hambrick, 2006). Variation in technology adoption has also been studied from an international business perspective (Arregle et al., 2013; Galang, 2012; Vernon, 1966). Recent studies suggest that globalization and convergence in human capital and technological infrastructures are narrowing the gap between countries in their adoption of new technologies (Comin and Hobijn, 2004). We engage in this scholarly conversation to understand better, from a microfoundations perspective, how incumbents across the world adopt emerging complex technologies (Foss and Pedersen, 2019) especially digital platforms (Nambisan et al., 2019).

Building on previous research suggesting that firms’ absorptive capacity is a strategic capability needed for technological innovation (Volberda et al., 2010), we have provided evidence that absorptive capacity influences technology adoption by directing

**Figure 3.2– The moderating effect of national regulatory systems and temporal orientation on managerial attention to and adoption of new platform technology**



*Figure 2a. The moderating effects of national level regulatory system soundness on the relationship between organizational absorptive capacity and managerial attention to new platform technology*



*Figure 2b. The moderating effects of national temporal orientation on the relationship between organizational absorptive capacity and managerial attention to new platform technology*

managerial attention to it. Controlling for country- and firm-level characteristics, we have found that, in firms with higher levels of absorptive capacity, managers pay more attention to the new platform technology (Figure 2a and Figure 2b). This finding

complements studies that examine the role of path dependence and agency in the firm's evolution (Hutzschenreuter et al., 2007; Thietart, 2016). Our analysis shows how institutional context can shift the relative importance of agency and path dependence.

Our findings reveal subtleties in how institutions affect the relationship between absorptive capacity and technology adoption. The results of our study do not fully confirm that variation in the quality of a country's regulatory systems—its government effectiveness, rule of law, and quality of regulations—has an effect on technology adoption. A combination of factors may account for this: advances in digital technology that have helped to speed up globalization, and also greater connectivity and mobility of talent (Buckley, 2009; OECD, 2008; Porter and Heppelmann, 2015; Yoo et al., 2010). This finding about established firms is in line with those of previous studies on how regulatory systems affect high-impact innovations in entrepreneurial companies (Stenholm et al., 2013).

Our further analysis, however, has made clear that there is a statistically meaningful indirect effect of organizational absorptive capacity on the adoption of new platform technology only in countries with a weak regulatory system (Table 3 and Figure 2a). The results indicate that in the process of adopting a platform technology in weak regulatory systems, top managers' attention is required to effectuate the organization's absorptive capacity. The results, in contrast to Hypothesis 2, show that in strong regulatory systems organizations are more likely to be able to adopt the technology even without top managers' significant attention. This result highlights managerial agency for a strategic change (Cho and Hambrick, 2006; Denis et al., 1996; Eggers and Kaplan, 2009) such as adoption of platform technology in countries which regulatory context is weak.

Our analysis reveals that there is an interaction effect for a national culture dimension, i.e., temporal orientation, on how incumbents adopt an innovation platform, as it is hypothesized in Hypothesis 3. The cultural orientation (i.e., short-term versus long-term) influences how managers understand and respond to strategic issues, as they base their response on established and collectively accepted values there (Barkema and Vermeulen, 1997; Jackson and Deeg, 2019; Kirkman et al., 2006; North, 1990; Yaveroglu and Donthu, 2002). Our analysis suggests that, in cultural contexts that tend to focus on the past and the

present, incumbents that develop greater absorptive capacity are prone to pay more attention to and adopt future-oriented technologies faster than companies in countries with a more future-oriented culture (see Table 3 and Figure 2b).

With this study we contribute to the literature on the adoption of innovations (Caselli and Coleman, 2001; Comin and Hobijn, 2010), and specifically on the cross-country adoption of platform technologies. We explored how national institutions, which are theoretically important for the adoption of platform technologies, interact with firms' abilities in the process of platform technology adoption. Our analysis clarifies that when formal and informal institutions work against platform technology adoption, this can be compensated for by firm-level adaptive abilities, specifically by absorptive capacity that directs managerial attention toward innovation. We also contribute to the attention-based view. We offer new insights into how different institution qualities may stimulate how organizational channels sustain managerial attention to adopt platform technologies (Ocasio, 2011; Shepherd et al., 2017). In so doing, we also contribute to the literature on cross-country adoption of digital technology from a micro-foundational perspective (Contractor et al., 2019; Foss and Pedersen, 2019).

Our study provides evidence of management- and organization-level agency in cross-country technology adoption, thus has managerial implications for technology developers and adopters. When planning how to manage their global market demand, technology developers should take into account not just characteristics at the country level but also technological ability of their customers. Existing literature recommends global technology providers to implement an aggregation strategy to gain scale and scope advantage (Ghemawat, 2018). Thereby, they can assist their customers in countries with a weak regulatory system or a short-term orientation to develop general technological capabilities that will enable them to adopt new technologies more rapidly (Dhanaraj et al., 2004). This is important, since one of the strategic factors in winning the battle for technological dominance is the installed base for the new technology (Suarez, 2004). Technology adopters' stakeholders and boards may consider that, in countries where the regulatory system and national culture of temporal orientation are less favorable, entrepreneurial top managers who are pro-platform play a more critical role. Organizations

that invest sufficiently in their technology capabilities can offset some of the institutional frictions against platform technology adoption. Furthermore, we know that changing a national culture or the overall quality of regulations is neither straightforward nor a short-term goal. Thus, policymakers can facilitate the firm-level development of technological capabilities in order to encourage private-sector efforts to adopt platform infrastructures such as Cloud technology.

The results of our analysis show a negative effect of existing joint investments between the technology provider and the adopter on the adopter managers' attention to new platform technology (Model 4:  $b = -0.19$ ,  $p < 0.01$ ). Previous studies found that involvement in joint ventures was negatively associated with innovative performance of the incumbent (Nicholls-Nixon and Woo, 2003) in the early stages of a technological change (Nagarajan and Mitchell, 1998). Future investigations of this issue can complement the rich literature on the usefulness of international joint ventures for parents (Dhanaraj et al., 2004; Hotho et al., 2015).

Future studies could also clarify whether different formal and informal institutions may influence the microfoundations of the successful commercialization of new platform technology, and how they might do so. One research question that might be answered by future studies is how formal and informal institutions can influence the mechanisms involved in building ecosystems around digital platforms (Gawer and Cusumano, 2008; Gawer and Phillips, 2013). Another question that could also be addressed in future research is how national institutions might be influenced by the various mechanisms through which platform ecosystems are developed—for example, network effects and innovation diffusion (e.g., Rogers, 1995), power dynamics (e.g., Santos & Eisenhardt, 2009), and knowledge and capability spillovers (e.g., Stenholm, Acs, & Wuebker, 2013).

### **3.6 Conclusion**

In our research we examined the effects of formal and informal institutions on cross-country adoption of platform technology in the early stages of its development. We argued that the technology adoption process should be approached as a joint outcome of managerial intentionality and institutional factors. Using original data from telecommunications

operators that were in the process of adopting Cloud technology, we tested a moderated mediation model of cross-country platform adoption. The results of our analysis confirmed that managerial attention to Cloud played a mediating role in the relationship between absorptive capacity and adoption of the platform. Our findings revealed nuances in the effects of regulatory system and temporal orientation differences in how firms' absorptive capacity can direct managerial attention given to the platform technology and showed that these affected the adoption process. We discussed theoretical and managerial implications of the results. These results have also enabled us to suggest a number of other valuable avenues for future research on how digital platform technologies are adopted in different countries.

# Chapter 4: We are going digital

## Leveraging organizational identity pluralism for proactive adaptation

**Abstract.** We investigate how incumbents adapt to a major technological change through an inductive study of three large and established firms. Our core contribution is a framework of how proactive incumbents turn their established identities into means of adapting to the technological change, here the digital revolution, through reflecting on and flexing, pluralizing, leveraging, and adapting organizational identity. We conceptualize meta-identity and sub-identity bricolage to explain organizational identity work while coping with the digital revolution proactively. We also distinguish between additive and transformative meta-identities, based on their effect on how adaptation projects are structured. Moreover, we find that managers across hierarchical levels complement each other's adaptation efforts; top managers promote meta-identity, and intrapreneurs construct sub-identity bricolage. Such identity works help managers avoid potential tensions between identity and innovation. We develop a multilevel identity-informed theoretical model of the firm's adaptation to major technological change. We discuss our findings and identify avenues for future research.

**Keywords:** *Adaptation, strategy process, organizational identity, cognitive inertia, intrapreneurship, digital transformation*



## **4 “We are going digital”: Leveraging organizational identity pluralism for proactive adaptation**

*“Here is a subtle truth: whatever you seek, you are.” – Jalaluddin Rumi (1207–1273)*

### **4.1 Introduction**

Adaptation to technological discontinuities, such as digital revolution (Teece, 2018), is critical for incumbents (Tushman and Anderson, 1986), and organizational identity (OI) has a central position in the adaptation process (Albert, Ashforth, and Dutton, 2000; p. 13). OI is the organization members’ shared perception about the core, distinctive, and continual features of their organization (Albert and Whetten, 1985). It provides the stimulus for adaptation (Ashforth et al., 2011; Ravasi and Schultz, 2006): Managers proactively take risks to protect their OI in the face of environmental and competitive threats (Ashforth and Mael, 1989; Bénabou and Tirole, 2016; Burke and Stets, 2009). For instance, comparing their own firm’s innovative performance with that of rivals can trigger managers to take higher risks in their innovation activities in order to (re)gain a better position for the firm (Greve, 1998). OI determines whether and how firms possess and deploy the assets and capabilities required for adaptation (Kogut and Zander, 1996; Tripsas, 1997, 2009; Tripsas and Gavetti, 2000). It influences how managers perceive the options for adaptation and consequently determines firms’ adaptability to significant changes in the business environment (Fiol, 2002; Henderson and Clark, 1990). Therefore, in terms of both stimulating and undertaking adaptation, it is imperative to manage OI.

In established firms, OI plays a defining role in adaptation, as it determines how managers frame their attention focus and prioritize issues and also helps the organization to maintain focus of organizational attention (Bundy et al., 2013; Kogut and Zander, 1996; Ocasio and Joseph, 2017); this is particularly so when managers are searching for, recognizing, evaluating, and selecting opportunities (Cornelissen and Werner, 2014; Gavetti and Levinthal, 2000; Hamilton and Gioia, 2010; March, 1994; Mathias et al., 2014; Shepherd et al., 2017). Given the central role of OI, scholars have identified a broad set of strategies by which top managers make the identity less inert (Anthony and Tripsas, 2016)

specially when they face with technological discontinuities (Tripsas, 2009; Tripsas and Gavetti, 2000).

In contrast to the richness found in the studies of OI (Cornelissen et al., 2007; Gioia et al., 2013; Pratt et al., 2016), OI literature on adaptation to technological discontinuities is still somewhat under-developed, and implicit simplistic assumptions prevail (Thorngate, 1976). In existing studies of adaptation to technological change, researchers predominantly tend to regard OI as a monolithic concept. This approach runs counter to theories that identify multiple nested and functional organizational sub-identities, identity dimensionality, and various narratives of the same “identity” across hierarchical levels of the organization (Ashforth et al., 2008, 2011; Ashforth and Mael, 1996; Brown, 2006; Corley, 2004; Foreman and Whetten, 2002; Pratt and Foreman, 2000; Whetten and Godfrey, 1998). The assumption that OI is inflexible is at odds with the theories that explain middle and line managers’ strategic role in adaptation (Biggart, 1977; Birkinshaw and Gibson, 2004; Burgelman, 1983b, 1984, 2002; Corley, 2004; Floyd and Wooldridge, 1992; Gioia et al., 2013; Gioia and Hamilton, 2016; Heyden et al., 2017; Oliver, 2015; Pratt, 2012; Wooldridge et al., 2008). Similarly very little attempt has been made to examine the implications of technology, industry, and market uncertainty and ambiguity for (identity) adaptation processes and outcomes (Khanagha et al., 2018; Navis and Glynn, 2010; Santos and Eisenhardt, 2005, 2009). In other words, there is a lack of studies that explicate these strategic nuances of OI—i.e., the existence of multiple sub-identities, organization-wide dynamism in identity, and high levels of business ambiguity and technological uncertainty—in adaptation to technological discontinuities.

The purpose of this study is to develop an OI-based theory of adaptation by incumbent firms. We address the issue of how managers from different hierarchical levels of organizations play a part in overcoming identity-driven cognitive barriers to adaptation. We analyze rich qualitative data relating to three firms that have been adapting to the digital revolution in different industries. Consequently, we suggest a multilevel model of adaptation. We use social identity theory (Burke and Stets, 2009) and OI-innovation framework (Tripsas, 2009) as guiding theories for studying the underlying identity mechanisms of adaptation. Our study contributes to the literature on managerial and

organizational cognition and on strategy processes used in adaptation to new technological regimes (Dosi, 1982).

We contribute to the adaptation literature by explicating the entrepreneurial strategies by which incumbents leverage OI for adaptation. Current studies have found there to be either mutually reinforcing or challenging relationships between identity and adaptation (Raffaelli et al., 2019; Tripsas, 2009). Continuing this line of research, we explain how incumbents deal with identity-challenging conditions of adaptation and deal with the cognitive lock-in effect of OI (Burgelman, 2002). In particular, our theoretical model adds to knowledge by illustrating new aspects of cognition- and action-oriented mechanisms of (identity and) adaptation (Gioia et al., 2010; Ott et al., 2017). Building on the dimensionality (Ashforth et al., 2008), segmentation, and plurality of OI (Pratt and Foreman, 2000), and the possibility of combining identity resources (Dalpiaz et al., 2016; Glynn, 2008; Kroezen and Heugens, 2012), we put forward a multilevel model of how top managers and intrapreneurs enable incumbent firms to adapt to (identity-challenging) technological change .

We also contribute to the literature on paradoxical leadership (Cialdini et al., 1995; Smith, 2014) by offering a more detailed model of how managers accommodate identity-related tensions. We illustrate how top managers can prepare the ground for intrapreneurship by communicating an identity that is abstract and ambiguous and a vision of different future while also maintaining the firm's current identity. We also show how the approaches taken by intrapreneurs moderate the tension between maintaining a stable identity and being able to adapt to change in the technological environment. We shed further light on the role firms' current and future OI (Gioia, Nag, et al., 2012; Stam et al., 2014) play in containing the identity-based tension. We therefore identify OI-based strategies for managing tensions associated with adaptation. By doing so, we complement existing research that highlight the role of organizational design for managing the tensions (Albert et al., 2015; Foss et al., 2013; Jansen et al., 2005, 2006; Lechner and Kreutzer, 2010).

In the following sections, we elaborate on the context of this research and on the method, and data. Next, we present our findings. We then put forward the various propositions that we derive from our model and discuss the theoretical and managerial

implications of the research. Finally, we suggest avenues for future research and present our conclusions.

## **4.2 Context**

The digital revolution is a very appropriate setting for studying how incumbent firms adapt to major technological change. Platform business models and business ecosystems have gained currency in the digital era and motivated managers to question and go beyond their existing linear business models. High-speed and high-capacity computing, robotics, autonomous vehicles, artificial intelligence, the Internet of Things, blockchains, 3D printing, and new methods of energy generation, storage and distribution are examples of the remarkable interconnected innovations that have resulted from the digital revolution. The maritime, energy, and professional services industries are ones that tend to be more conservative, and managers have conflicting perspectives on how their industry may be affected by the digital revolution and at what point. This makes these industries an appropriate context in which to research how incumbents adapt, from an identity-based perspective. We selected this context as these industries contain businesses with established identities, whose recent history has been less turbulent. Even though a digital revolution is underway, established firms may be more subject to inertia, especially those that have had a strong competitive position for a long time.

## **4.3 Methodology and data**

We conducted a multiple-case embedded design using qualitative data. Methodologists recommend this design when there are multiple units of analysis that complement each other within different cases. This type of research design makes it possible to arrive at a comprehensive understanding of the cases (Yin, 2009). In this study, we selected a few adaptation projects from each firm as our units of analysis. The projects we studied included process improvements, implementation of new technology, innovation incubators, employee participation in strategy processes, spin-off cases, activities involving corporate venture capital, and internal venturing. All of the projects were undertaken in order to respond to the digital revolution.

### 4.3.1 Sampling and data

Employing purposeful sampling, we chose three firms from relatively stable industries, each of which had an established OI. This approach enabled us to build a firm grounding for our theory than if we had focused on industries that were more similar (Harris and Sutton, 1986). Also, to answer our research question, we had to collect longitudinal data that would reveal managers' strategies over the lifecycle of each adaptation project. This aim required us to study cases where rich insider archival data were available, and where the managers concerned were open to sharing their data with us. These criteria overrides the randomness principle of sampling, as we are focusing on theory building in our research (Siggelkow, 2007). Filtering the population of firms using these criteria, we ended up with three firms. The firms in question are TPORT, from the maritime industry, ELECT, from the energy sector, and HUREM, from the professional services industry: see Table 4.1<sup>3</sup>. The first two firms are state-owned, and the third is a listed firm. This sample provides a pluralistic setting, as recommended for strategy process research (Jarzabkowski and Fenton, 2006), in which to study the adaptation challenges faced by incumbents. We concentrate on adaptation projects that were initiated in the case firms by middle and line managers (from now on, we call them intrapreneurs). We used two sources of data: interview and archival data. We began our data collection in summer 2015 to answer the questions of what the main hurdles might be in bottom-up digital innovation projects, and how intrapreneurs might clear these hurdles. The main criterion in selecting projects was that the idea should have arisen and been developed initially without any specific direction from top managers. The next criterion was to study both ongoing and completed projects.

We also investigated the organizational setting where the intrapreneurs initiated and ran their innovative projects. To do so, we conducted introductory interviews with the chief innovation and strategy officers of the firms to develop a big picture of innovation and intrapreneurship at the firms. In these interviews, we also managed to identify the intrapreneurs running the adaptation projects. We used this list of the intrapreneurs to plan for our next interviews using a snowball procedure (Lincoln and Guba, 1985). This

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<sup>3</sup> We use pseudo names for the case firms, for a confidentiality purpose.

**Table 4.1– Firms in our study**

	<b>TPORT</b>	<b>ELECT</b>	<b>HURAM</b>
Domain	Transportation	Energy	Professional services
Ownership	Unlisted, public	Unlisted, public	Listed
Core of business	Administration	Engineering	Consultancy
Prevalent change in environment	Digitalization, Alternative energy sources	Digitalization, Alternative energy sources	Digitalization, Freelancing
Market type	B2B	B2G and B2C	B2B and B2C

procedure helped us to reach out to hidden intrapreneurs as well: ones who were not recognized by top managers, even though their colleagues were aware of them. The top managers granted us access to archival data relating to the projects. This included limited number of reports and presentations about intrapreneurship, which is limited in nature (an average of around 100 pages per case). We collected publicly available data about the firms from various sources including annual reports, social media posts, newsletters, external experts' opinions about the firms as expressed in the media, industry best practice and reports; this amounted to more than 1,000 pages across the three firms. These data are about organizational structure design and strategies, changes to the top management teams, investment in start-ups, and innovation programs.

The other source of our data was semi-structured interviews with intrapreneurs. We conducted 36 interviews and focus group discussions, lasting around 50 minutes on average (40–90 minutes). We selected the interviewees from managers who (1) were willing to participate, and (2) worked at different departments and hierarchical positions (we included interviewees both from existing internal ventures and spin-offs). We asked the interviewees for their opinions on the dynamics of their industry, changes in customer, supplier, and competitor preferences, and technological developments, and how these changes related to the business of their firm. Afterwards, we asked them to explain and comment on how their firm had reacted to the changes and followed this by asking about the importance of their adaptation projects in such a context. We then asked them to elaborate on the process of developing their adaptation ideas and projects, highlight any problems, and describe how they pursued their adaptation projects in their organization in terms of getting the resources, support, and recognition they were looking for.

After interviewing the intrapreneurs individually, we presented our primary findings to several focus groups, which included the strategy and innovation managers of the three firms and incorporated their comments into our data and models. We transcribed the audio recordings of the interviews and the focus groups, which resulted in about 700 pages of text, in 1.5 spacing. Details of the textual data are provided in Table 4.2. We started data collection from TPORT and HUREM in July 2015 and from ELECT in February 2016, and the data collection phase finished in 2018 after we had reached theoretical saturation (Glaser and Strauss, 1971).

**Table 4.2– Details of our sample**

	TPORT	ELECT	HUREM
Number of embedded projects	6	3	10
Interview time (approx.)	20 hours	10 hours	25 hours
Number of top managers	3	4	4
Number of middle and line managers	15	3	21
Focus group time	4 hours	-	6 hours
Public and insider textual data (approx.)	700 pages	300 pages	500 pages
Secondary data	Yes	Yes	Yes

#### 4.4 Analysis

We began by analyzing empirical data, then recognized and developed theoretical concepts based on this empirical analysis (Dubois and Gadde, 2002). To do so, we employed a two-level coding schema (Strauss and Corbin, 2008). We systematically combined inductive and deductive approaches when emerging codes or the relationship between them resonated with current theoretical concepts of OI and the proactive adaptation literature. (Creswell, 2009; Dubois and Gadde, 2002). More detail on our research procedure is provided below.

We initially developed an abstract model based on the data we had collected early on in the research. To help ensure that we achieved the required credibility, consistency, and transferability in terms of the outcomes of our qualitative inquiry, we immersed ourselves

in the firms for a long time to make sure we were sufficiently involved with the context and the data (Lincoln and Guba, 1985). We collected both real-time and historical data for our research subjects (Eisenhardt and Graebner, 2007). To increase the transferability of our research (Eisenhardt and Graebner, 2007; Yin, 2009), we made within-case and cross-case comparisons, based on data of multiple embedded units of analysis in each case. We also (4) generated thick descriptions and received feedback from insider informants as well as from outsider informants on the validity of our analyses (Langley, 2007; Lincoln and Guba, 1985). We implemented these measures by taking the following steps:

**Step 1:** *Establishing a timeline of events and categorizing data.* We organized the data chronologically, taking note of events we identified in data. We categorized the data as either general or project specific. For each case, the adaptation process started at a different point in time. Establishing a sequence of events for each case allowed us to make sense of the data and to identify what additional data we needed to collect.

**Step 2:** *Understanding top managers' and intrapreneurs' activities and developing theory.* Using the textual data analysis methods, we found salient concepts associated with the roles played by top managers and intrapreneurs (both direct and indirect roles) in the adaptation projects. We observed and discussed a set of relationships between the concepts, and we highlighted similarities, complementarities and differences in how top managers' and intrapreneurs' perceived the innovation process and its context and behaved during the projects. We corroborated the outcomes of this step using the results of analyzing archival data.

**Step 3:** *Collecting further data to refine the theoretical model.* We analyzed our data immediately after collection, which enabled us to refine our coding and ask for more data while the data collection was still in progress. This procedure helped us to zoom in on the specific part of our theoretical model when we received feedback from insider and outsider informants. After each iteration, one of the authors presented the other with an updated theoretical model and cross-checked his understanding of the data. At the same time, we validated our findings in several focus group discussions at the case firms. We finalized our analysis by validating core concepts (Evered and Louis, 1981; Miles and

Huberman, 1994) and making systematic connections between them to form a data structure (Gioia, Corley, et al., 2012; Saini and Shlonsky, 2012). Table 4.3 presents this data structure and shows key observations and core concepts. The content of the first-order category is similar to how interviewees expressed their ideas and how data were presented in archival sources. The content of the second-order and aggregate concepts are what we constructed based on the first-order concepts and on current theoretical views. We draw on the second-order and aggregate categories to develop our theoretical model of the relationship between OI, intrapreneurship and adaptation in incumbent firms.

## **4.5 Findings**

In Section 4.5, we report briefly on our findings relating to the adaptation process, and we then provide a detailed description of each step of the process in the subsequent sections (Section 4.6 and 4.7). Our data suggest that different managers played complementary roles in the incumbents' adaptation. In response to significant technological trends, managers who were proactive and innovative set up initiatives, and organized and mobilized resources in order to protect their firm's OI as a major industry player; in Table 4.4 we show why managers were motivated to adapt in this way, given their firm's technological characteristics. To accommodate and also motivate the bottom-up initiatives, top managers propagated a meta-identity and projected an image of the future that was ambiguous and yet desirable. They propagated such identity of future by featuring "who we are becoming as an organization as a result of our adaptation projects." They also tapped into the existing OI pluralism by providing a narrative that conveyed an abstract and ambiguous understanding of "who we are as an organization" as their organizational meta-identity. We define meta-identity as an abstract and expanded reading of the OI that is widely adopted by the members of an organization. We say that an OI is pluralized when the meta-identity is open to different interpretations and narratives and highlights the organization's multipotent capabilities. Having a pluralized OI can be a good option if it is also in line with a future OI that the organization is seeking to convey, which will enable it to respond to the new technological regime. The multipotent capacities were the under-utilized or easily reproducible organizational capabilities that could be used for different business purposes. Knowledge-based capabilities and resources that are embedded in organizational networks are the

examples of such capabilities. The multipotent capacities were found in, for instance, multi-skilled colleagues, the intrapreneurs themselves, and from colleagues' networks, previous routines, and the firm's existing or potential physical, digital, and intellectual assets. The meta-identity, which was in line with the identity of future, provided a cognitive space that gave people within organization room to seek and develop solutions to adapt their organization to the digital revolution. Afterwards, the adaptation projects were established. How the sub-identities of the projects were perceived by the intrapreneurs and the other key managers influenced where the project were established: inside the existing structure of the organization or outside the existing structure.

In our cases we noted how intrapreneurs used entrepreneurial techniques, *bricolage* (Baker and Nelson, 2005) and *prototyping* to overcome the cognitive barriers that arose because of OI rigidity. As an integral part of their intrapreneurial activities, they constructed a new sub-identity by combining and reconfiguring existing sub-identities and OI narratives, routines and practices, sometimes with external elements borrowed from the practices of new competitors. In other words, the raw materials for their sub-identity bricolage were sourced from existing practices, beliefs, key people within the firm, the firm's customers, and the practices of new entrants. By doing this the intrapreneurs were able to present their ideas for adaptation in a way that was in sympathy with existing OIs. They also indicated how their ideas could be realized, and to do so they presented prototypes, which help to confirm whether a project will be feasible and appropriate. With the same purpose of the prototyping, the intrapreneurs used identity bricolage in their negotiations with peers and supervisors. Using these techniques could help them acquire the support and resources they needed to develop the idea further. They secured resources required to develop their projects by reducing the ambiguity surrounding the future identity that had been emphasized by top-level managers and by serving as a model of the type of organic adaptive behavior that would be required.

**Table 4.3– Data structure**

First order concepts and observations	Second order concepts	Aggregate concepts
<ul style="list-style-type: none"> <li>Bringing pro-adaptation members into the senior management team</li> <li>Creating programs and organizational departments to support/facilitate adaptation</li> </ul>	Signaling commitment to adaptation	
<ul style="list-style-type: none"> <li>Reflecting on the organization's current identity</li> <li>Paying attention to technological trends, threats and opportunities</li> <li>Envisioning the future of the organization</li> <li>Keeping the vision of the future open to multiple (even paradoxical) interpretations</li> </ul>	Conveying an ambiguous future	
<ul style="list-style-type: none"> <li>Recognizing (negative) changes in the industry position relative to challenger industries</li> <li>Making comparisons with other incumbents and challengers</li> <li>Engaging in new collaborations with pioneering entities (research institutes, universities and consultants) and their business ecosystems</li> </ul>	Speculating on new reference points	Initiating adaptation: <b>Reflecting on and flexing established OI</b>
<ul style="list-style-type: none"> <li>Communicating a metaphorical abstract narrative of identity that incorporates entrepreneurial elements</li> <li>Underscoring the importance of how the business is done rather than only the business output</li> <li>Refining the perception of what the firm was good at it historically and referring to it more frequently</li> <li>Referring to new strategic performance indicators</li> </ul>	Promoting a multipotent meta-identity	
<ul style="list-style-type: none"> <li>Paying attention to technological trends, threats and opportunities</li> <li>Looking at business issues, e.g., customers' complaints or new requests, as opportunities</li> <li>Addressing a business issues by thinking about new digital technologies or business models</li> <li>Thinking about one's own skills and background and one's social network, untapped resources, and old routines that might help put the idea into action</li> <li>Searching for people or departments that may know how to deal with the problem at hand</li> <li>Discussing the idea with colleagues and customers</li> </ul>	Formulating an idea for adaptation project	Defining adaptation projects: <b>Initiating a new sub-identity</b>
	Constructing sub-identity bricolage (Linking multipotent capacities to the idea)	
	Championing the adaptation project and its sub-identity bricolage	

Table 4.3 — Data structure (continue)

First order concepts and observations	Second order concepts	Aggregate concepts
<ul style="list-style-type: none"> <li>Building a small (informal) team to make use of existing or previous relationships</li> <li>Adding people from other departments/divisions to the team over time</li> <li>Adding (hiring) members/interns from outside the organization to the team over time</li> </ul>	Setting up the adaptation project	
<ul style="list-style-type: none"> <li>Working over-time and skunkworks</li> <li>Undercover working with a sense of urgency</li> <li>Receiving feedback from customers and colleagues, media commentators, or other collaborative stakeholders</li> <li>Spreading the newly generated know-how in the organization and encouraging other to use it</li> </ul>	Prototyping the project's product/service	Realizing adaptation projects: <b>Substantiating a new sub-identity</b>
<ul style="list-style-type: none"> <li>Connecting internal and external suppliers to the product or service</li> <li>Collaborating with potential internal and external suppliers and customers</li> <li>Satisfying internal and external customer needs</li> </ul>	Forming internal and external business ties	
<ul style="list-style-type: none"> <li>Demonstrating the feasibility of the adaptation idea</li> <li>'We versus them': middle and line managers and top managers <ul style="list-style-type: none"> <li>Risk taking tendency in top versus middle and frontline managers</li> <li>Sense of unity with the organization in top versus middle and line management levels</li> <li>Sense of urgency in top versus middle and line management levels</li> </ul> </li> </ul>	Negotiations within and across hierarchical levels	
<ul style="list-style-type: none"> <li>Going digital: Employing (digital) platform business models, using (big) data and digital tech for efficiency</li> </ul>	Finding a fit between the project and the opportunities/threats	Negotiating adaptation projects: <b>Qualifying the new sub-identity</b>
<ul style="list-style-type: none"> <li>Matching adaptation ideas and projects to the meta-identity</li> <li>Matching adaptation ideas and projects to the future identity</li> </ul>	Finding a fit between the sub- and the meta-identity and a fit between sub-identity and the future identity	
<ul style="list-style-type: none"> <li>Promoting successful cases as models for adaptation</li> <li>Reciprocal acceptance of the adaptation project by intrapreneurs and their organization</li> <li>Strategic importance of the adaptation project to the organization (degree of relevance and immediacy of the adaptation project) <ul style="list-style-type: none"> <li>Resource- and process-dependency</li> <li>Stakeholder acceptance</li> </ul> </li> </ul>	Recognizing the new sub-identity <hr/> Structuring the new sub-identity	Embedding adaptation projects: <b>Adapting OI</b>

**Table 4.4– Motivation and organization of the firms in early stages of adaptation**

	<b>TPORT</b>	<b>ELECT</b>	<b>HURAM</b>
<b>Main trigger for adaptation</b>	Pressure from shareholders (Low margins, under-use of resources)	Foresight of top managers	Customer trends and action of challengers
<b>Established OI and technology</b>	Technology-neutral	(Current) technology-based	Technology-neutral
<b>Technological orientation before adaptation</b>	Technology user	Technology-savvy	Technology user
<b>Technological orientation for adaptation</b>	Technology user and promoter	Technology user, developer, and promoter	Technology user and developer
<b>Perceived need for swift response to technological (i.e., digital) trends</b>	Widely felt at different organizational hierarchical levels	Only felt by top managers and a few middle and line managers	Widely felt at the top and line management level; SBU managers are divided
<b>Organizational structure used for adaptation projects</b>	Separate organization	Separate organization	Part of the same organization

When intrapreneurs succeeded in developing their adaptation projects, their interaction with top managers and other organizational stakeholders directed how the new sub-identity of adaptive projects became established. This sub-identity was recognized as either a transformation or addition of the existing OI. The sub-identity was seen as part of the overarching meta-identity, even though it was considered to be outside the boundaries of the existing OI. The transformation sub-identity fortified the established OI, and the addition enriched the meta-identity.

Depending on how flexible the OI was compared to the new sub-identity, the adaptation projects were either integrated into the main organization or set up as separate entities. Adopting sub-identities that gradually adapted the OI changed managers' and intrapreneurs' interpretations of their OI.

For brevity, we outline each step of the process only in relation to one of our firms: TPORT for the first step, ELECT for the second step, HURAM for the third, and TPORT for the fourth step. For the next and last step, we compare the three.

## **4.6 Pluralistic identity strategy: Flexing, pluralizing, and leveraging OI**

### **4.6.1 Top managers initiate top-down adaptation: Reflecting on and flexing established OI while addressing “who are we (becoming) as an organization?”**

Top managers attempt to protect and enhance their OI, by staying relevant to unfolding technology-driven changes. They start to take a more flexible approach to the current OI by propagating an open narrative of the established OI to explore the potential of the technological opportunities legitimately. This exploration is, by definition, open to different interpretations of the firm’s future and possible options.

Our data suggest that top managers employed four means to flex the established OI in order to achieve adaptation: *signaling an organizational commitment to adaptation, speculating about new reference points, conveying an ambiguous future identity, and promoting a meta-identity*. With the first, “signaling commitment to adaptation,” the top managers created organization-wide awareness of their aims in terms of innovation. This signaling took place after they had reflected on the technology-driven changes across the industry as a whole and stimulated more middle and line managers to engage in adaptation. “Speculating about new reference points” was concerned with contemplating potential norms that were new to the industry as they were associated with emerging technologies. The top managers paid attention to companies that were following the new norm—for example, small entrepreneurial companies and technology holders from other industries—as a set of potential new practical reference points. By speculating about the new reference points, the top managers examined how the OI and the ways in which it was understood were or could be adapted to the business principles and practices associated with the new technology. In light of such speculations, the top managers were looking for ways in which the adaptations might be made without seeming to jeopardize the current OI, and then to convey that to others within the organization.

Although there was as yet no meta-identity, the top managers promoted the idea of one. The meta-identity emphasized on the potential for the organization to have a promising future, rather than focusing on its current characteristics and core capabilities. The meta-identity served to unify the organization and filter information less restrictively. The picture

the top managers painted of the organization's future, a future in which it had adapted to the new digital technologies, was one that was both appealing and ambiguous; it was desirable enough to motivate employees to adapt but at the same time sufficiently fuzzy to relax the constraining effects of the OI. The meta- and future identities were aligned and mutually corroborating.

The interview data and document reviews from the firms gave us a clearer view of how top managers flexed the established OI to adapt their organization to the digital revolution. We report below on how the TPORT top managers did this.

A TPORT's executive said that "*[the firm's] community, market parties, [themselves] and all those stakeholders [are] a rather traditional community.*" According to a former innovation manager who was managing external corporate venturing activities of TPORT, the characteristics of the industry were that it was "*very conservative ... not developing very fast, focused on low margins and doing the current thing better and better, trying to optimize current thing but not a lot of new developments.*" According to an operational manager with a long background in multiple firms in the industry, the key competitors were very similar:

*"It's quite interesting if you look, for instance, at the websites of the [three main industry players] and you delete the header, then you would have a difficult time [distinguishing them], ... You could swap them around and just ask yourself, which is which? You will basically see that they all give out the same message: We have the biggest [facilities], we are the access to Europe, we have good quality."*

Therefore, apart from their current geographical competitive advantage, which was under threat because of the expected decline in the fossil fuel market, the top managers realized that the firm needed another point of differentiation to be successful in the industry. Moreover, senior managers from different departments agreed that TPORT was no longer the largest player in the global industry. They compared the firm's performance with that of competitors in mainland Europe and monitored its performance over the previous few years (TPORT annual reports 2013-2018). The lack of distinctiveness, especially when the future of digital business was unclear, motivated them to search harder for a way of creating a

“unique selling point” for TPORT. The firm’s former innovation manager described what had motivated them to adapt to the new industry conditions as follows:

*“Maybe technology could also take a direction where we are no longer in the driving seat, but you have the Airbnb of this world in the driving seat. Then we can only be there to make sure that this beautiful infrastructure [of TPORT] is in place without creating any added value. As for the rest, we hope we will get our customers to come to us. I think that could be a potential danger of all the developments and we are trying with [our innovation program], for instance, to look at how we can enable ourselves to be in the driving seat instead of letting a lot of other parties develop that.”*

Recognizing that there had been a drop-off in TPORT’s performance, managers instead differentiated their organization as *the best* player. i.e., *a model of innovation* in the industry. At the same time, they realized that the new technologies offered opportunities for the firm. After a change of CEO, in 2012 they started new strategizing projects, which were used by TPORT to present its employees with new images of its business future. Strategic documents produced by TPORT recommended “breaking new ground” by strengthening customer networks and creating a portfolio of strategic alliances. In internal communications, people were inclined to go beyond doing business like a “landlord” as their central metaphor for who they were as an organization. In internal strategy meetings, intrapreneurs used “landlord plus” as a metaphor for who they were becoming. To realize “landlord plus,” top managers encouraged employees to submit their innovative ideas to an “innovation lab” program. The new top management of began supporting grassroots initiatives for digital transformation of not only the organization but also its business ecosystem. Over time, the level of support was extended; initially support had been provided only for a very few innovative ideas that had involved a long wait for approval from the previous top managers. Another program, *game changer*, was established to support TPORT employees’ ideas for digitalization—ones that would not have been developed in the firm’s traditional business ecosystem.

While TPORT’s formal reports prior to 2016 contain a small amount of discussion about digital transformation, from 2016 the reports provide more detailed discussion of the

firm’s digital initiatives. For instance, in the 2016 annual report, there is a focus on how digital transformation will have positive effects on TPORT’s efficiency and on how under-utilized resources are being leveraged for digitalization. In the 2017 report, the firm outlines how it is differentiating its business through digitalization and introducing new revenue streams by selling purely digital and data-based services. All in all, to effect the change, TPORT is promoting its identity as *landlord plus* to position itself as an innovative force and as a digitally adapted industry player.

**Table 4.5– OI and meta-identity characteristics**

	Nature of OI	OI metaphor	Meta-identity metaphor	Future image <sup>4</sup>
TPORT	Harbor and maritime industry’s most innovative player	Landlord (administration and accounting)	Landlord plus: Solver of <i>big problems</i> (additive meta-identity)	Extended business: Innovation platform leader in the maritime industry (open platform)
ELECT	Owner of major infrastructure in the energy network	Asset manager (engineering and maintenance)	Network plus: leader of energy value constellation (additive meta-identity)	Extended business: energy innovation platform leader (open platform)
HURAM	Provider of high-quality HR consultancy services	Staffing (staffing and HRM for firms)	Shaping the world of work: navigating HR and matchmaking (transformative meta-identity)	Transformed business: HRM transaction platform leader (closed platform)

To secure their desired position, several of TPORT’s top managers, including the CFO, Social Innovation Officer, and Logistics Business Manager, stated in their interviews that they relied heavily on the creativity of employees. They did not have any specific product or service in mind to be produced and created. Instead, they just focused on the potential of their organization to generate ideas and seize the opportunities offered by a digital industry. The top management team of the TPORT secured the budget and other support and eased the criteria used to screen ideas for additional support. They monitored the progress of the first wave of internally generated innovations and invited the

<sup>4</sup> Innovation platform and transaction platform are two ends of a platform business model spectrum In an innovation platform the owner and its business partners share technological building blocks to create new complementary products, i.e. products that enhance the usefulness of the platform. A transaction platform is an intermediary that only organizes transactions, e.g. buying, selling, and using, for individuals and businesses (Cusumano, Gawer, and Yoffie, 2019; Pages 18-20).The openness of a platform has to do with the degree to which the platform owners control the core technology of the platform (Gawer, 2009).

intrapreneurs concerned to concentrate on applying digital technologies (Implementation agenda of TPORT's vision 2030, 2013).

In a nutshell, the top managers maintained a broad perspective of their business and infused a multipotent meta-identity into it. The incumbents' main points of differentiation, derived from their past performance and organizational capabilities (rather than only their current products and services), support the infusion of the meta-identity. Information about the established and meta-identities is presented in Table 4.5. The meta-identities allowed room for differing interpretations and their consequent actions. Establishing innovation programs also signaled a commitment to the adaptation from those lower down the organizational hierarchy.

#### **4.6.2 Intrapreneurs define the adaptation project: Initiating an adaptation sub-identity while addressing the issue of “what we do as an organization”**

Intrapreneurs are exposed to changes in technology on both the supply and the demand side. They closely observe changes that represent threats and opportunities in their business environment. Because of their intrapreneurial disposition, they focus on capturing the opportunities that also help them protect their OI from the threats. Supported by top managers' speculations about new reference points and signaling of adaptation, the intrapreneurs take the initiative to exploit the opportunities—for example, by addressing new types of demand. They are adept at recognizing and making use of different organizational resources in terms of human, social, technological, and intellectual capital. However, when they do so, they frequently encounter difficulties because of the inflexibility of organization-wide cognitive frames, e.g., OI. We now elaborate on the various aspects of this cognitive inflexibility and how our intrapreneurs dealt with it when taking forward their adaptation projects.

In our interviews, the intrapreneurs frequently referred to a problem they faced when pursuing new ideas and asking for approval from supervisors. Their supervisors reacted by saying “It is not our business” (NOB), because the potential of the intrapreneurs' ideas seemed to them too far off in the future. Below, we detail how intrapreneurs used cognitive techniques to answer the question “what are we doing as an organization?” in

order to be given approval. Our findings indicated that they undertook three types of activity to get their adaptation projects off the ground. They usually searched for and made use of under-utilized resources and capabilities within their organization to advance their ideas. However, at some point, when the problem-solving required resources and deployment methods that were relatively new, they needed approval from supervisors to acquire those resources. The approaches they took at this stage included *Formulating the idea of adaptation project*, *associating multipotent capacities and sub-identity bricolage with the adaptation project*, and *championing the adaptation project and its sub-identity bricolage*.

Essentially, intrapreneurs come up with ideas to solve problems raised by customers or to take advantage of opportunities that others had not noticed. They checked whether their ideas could be formulated in a way that would enable them to pass an internal NOB test. In addition, the ideas had to be perceived as desirable and feasible by others within the organization. The intrapreneurs envisaged that their ideas were capable of realization because they were in line with what customers wanted and with the views, capabilities, routines and values of the firm. This intrapreneurial practice had an identity process, which is essentially cognitive, woven into it. In their minds the intrapreneurs saw how they could link the “multipotent” capacities to their adaptation ideas. The multipotent capabilities were the ones that top managers sought to encourage the intrapreneurs to leverage when they promoted the meta-identity. The intrapreneurs considered new combinations of the multipotent capacities. This was a way they could formulate their initiatives as relevant to those who were stricter about releasing resources.

In other words, the intrapreneurs constructed a sub-identity bricolage for and intertwined with the adaptation projects. Sub-identities were formed by (1) the support of the members (from different parts) of the organization that intrapreneurs saw that they could collaborate with to solve a problem, (2) current or former organizational practices that middle and line managers used to solve a problem, and (3) widely acceptable narratives about what the organization was supposed to be doing. By linking these raw materials for OI in creative ways, intrapreneurs constructed a new sub-identity bricolage whose components were, at least to some extent, native to the organization, and so were unlikely to conflict with its current identity. When needed, the intrapreneurs used new identity

elements, considering the room offered by the meta-identity or future image of the business. The intrapreneurs initiated the new sub-identities by thinking about and planning to form a team and giving it a narrative that was aligned with the meta-identity and its promise for the future. Backed by sub-identity bricolage, they championed their ideas at different levels of the organization to gain support and resources and to set up collaborations. This also meant that they were less likely to encounter an NOB reaction to their adaptation projects.

To sum up, there were two ways in which the intrapreneurs were able to overcome initial hostility to their project. First, they convinced others of its desirability by emphasizing how it addressed customer and environmental trends. Second, they maintained continuity of identity by incorporating elements of the current OI in the new sub-identity bricolage. We now discuss what intrapreneurs at ELECT told us about how they initiated the sub-identities associated with their adaptation projects.

ELECT's employees, who were mainly electronics and power engineers, were in most cases reluctant to adapt to digital technologies. According to an ELECT manager responsible for organizing adaptation projects, many of the firm's senior managers did not see any urgency to change their business for the foreseeable future. Even when they recognized the technological trends, they thought that their influence on their business would be marginal. As ELECT's strategy manager put it,

*“many people do not understand, but this is not always the issue, but they do understand that the world of energy is changing. We need to do new things within our organization; people need to start understanding that. ... People define what they do in terms of their actions, not in terms of their added value [which is at odds with the adaptation approach of the ELECT]. If we talk in terms of ‘this is the value that we add’, for a lot of people, it’s very difficult, because [they react to the value discourse by saying, for instance,] ‘what do I need to do?’ A lot of them are not interested in it.”*

To tap into the new digital opportunities, ELECT decided to embark on a new strategic direction of exploring and “inventing the future.” The firm hired an entrepreneurial and digital expert as a new head of the business development department. Afterward, the top management called for ideas in the emerging business area. Several intrapreneurs put

forward their innovative business ideas to make ELECT business “*smart*” by developing a business centered on smart grid, smart home, smart city, and smart charging. When putting out their call, top managers were looking for “*everybody [who] just can come up with a good business model based upon where [he/she is] working inside his own business within [ELECT].*” A manager responsible for the initial screening of these new ideas said “*almost on a daily basis people came to me with an idea, of course.*”

The newly appointed digital manager told us about the various processes she went through when putting her ideas for this new area of business into action. She first created active ties to strategy and research departments within ELECT. She said to us that they “*wanted [adaptation] projects to obtain customers’ perspective on energy consumption.*” This type of view required a new kind of human capital sometimes from outside of the organization. An ELECT intrapreneur commented that they had needed to look for people who were knowledgeable about the market from a customer’s perspective, not from a grid perspective: “*looking from an outside-in perspective, like if you drive an electric car, what do you need?*” This is how she scouted to find her team from different departments within ELECT and outside the organization. An intrapreneur told us about her experience with the process of idea development. She said,

*“it started with an idea, with the partner on the outside. We defined the idea together. Brainstorming, we came up with a proposition, and I then went to the [ELECT board] to receive some support on a certain technology ... then, for example, IT delivered some people ...Then we formed project teams who were doing that specific project.”*

She continued about the importance of selecting team members purposefully:

*“talking to everybody about everything? That’s the stupidest thing that you can do... You need to be very aware of who has to gain what and who is making the final decision.”*

At ELECT, intrapreneurs at different levels of the organizational hierarchy frequently visited more advanced projects in other countries to gain inspiration and build a

network of technological collaborators that would help them to clarify and realize their vision for adaptation.

As is evident from our data, the firms in our study followed the same steps when initiating a new sub-identity. In formulating an idea, intrapreneurs address business problems and opportunities that arise because of technological changes. To do so, they explore possibilities in terms of securing resources and support, primarily from their organization; they then champion those ideas that have organizational backing. These ideas can be sold more easily because they are already rooted in the established OI.

It is extremely difficult to separate out this step of the adaptation process from the next two steps, namely substantiating the new sub-identity and qualifying it. Formulating idea and realizing it overlap as thinking about a project and formulating new ideas continues while intrapreneurs are realizing the initial project ideas. We present our findings relating to substantiating and qualifying new sub-identity in the following sections, keeping in mind the overlap between the three steps.

#### **4.6.3 Intrapreneurs realize their adaptation project: Substantiating the new sub-identity while answering the question, “how we are doing as an organization?”**

Intrapreneurs gradually substantiated new sub-identities, motivated by a desire to seize opportunities and avoid threats to their organization. Afterwards, they demonstrated the relevance and feasibility of their adaptation projects by substantiating their newly developed sub-identities. Establishing relevance and feasibility helped them to acquire resources to develop their ideas further. They championed their idea starting from their circle of close colleagues and moving outwards to more distant colleagues. They also invited certain other people to join them in realizing the adaptation idea, and organized teams to prototype the idea. Meanwhile, they established business connections with a small number of suppliers, collaborators, and customers. An adaptation project with a prototype and substantiated sub-identity bricolage was more likely to be successful in OI negotiations with key resource holders who still had reservations about the project’s relevance and feasibility. Using formal organizational forums, informal connections, and office politics, they got buy-in from key resource

holders and obtained resources for the adaptation projects (e.g., new hires, more autonomy, financial resources). The gradual realization of the new sub-identity helped the intrapreneurs also to adjust their ideas to better fit in the OI.

The intrapreneurs behaved in similar ways in terms of how they found their (identity) bricolage components. For example, a HURAM intrapreneur said to us:

*“I just asked around. I asked my director, ‘do you know who I need for this?’ and I just asked people, ‘Can you help me? Or do you know somebody else who can help me?’ Just like that.”*

In terms of developing an adaptation project, a HURAM intrapreneur said:

*“we do experiments. We start with small experiments, then see what the reactions are, and if it works. We start really small and only with a few people and then research if it’s something we can develop even further. Then we have to make it an official project and also officially ask for resources and stuff like that.”*

Talking about how their teammates manage to work on the adaptation projects besides their everyday jobs, another HURAM intrapreneur said:

*“people do it besides their regular jobs. It doesn’t cost too much time, so they can do it as an extra. Next to their regular jobs. Of course, ... only for a few hours. Then if we haven’t started ..., we’re going to start experimenting on next month. Then after the experiment, we decide whether ... who needs to free up some time and then really commit to the project.”*

All of the intrapreneurs we interviewed in HURAM agreed on the importance of experimentation, prototyping, and building an ecosystem around their adaptation projects. For instance, an intrapreneur commented that:

*“most important things are in these experiments [if] people want to pay for the service we develop. We can see those things happening in the experiments. Then when we think it’s a successful service, we start developing the technology behind it and*

*whatever is necessary to make it a service we can actually sell and make it a regular service from our business.”*

The intrapreneurs spread the word in their organization only when they had managed to create a prototype and develop network ties with customers and other important key people in the organization.

*“We developed this service for the [a bank] because we thought there [would] also be other organizations who will need this product.”*

As the new sub-identity gradually become more widely accepted incorporating the feedback intrapreneurs received on prototyping and implementing the project from different stakeholders.

#### **4.6.4 Managers negotiate the adaptation project: Qualifying the new sub-identity**

As the process of initiating and substantiating new sub-identities progresses, there were negotiations between the intrapreneurs and top managers about the adaptation projects and their new sub-identities. Intrapreneurs who managed to convince top managers that their projects fitted well with the opportunity/threat frames, the meta-identity, and the future image of the organization received resources required to develop their projects further. Intrapreneurs achieved this by using in-group and out-group negotiation strategies. Top managers sought to reduce the ambiguity of the meta-identity and future image and to make them clearer. They thus appreciated ideas and adaptation projects that would help do this.

When speaking about why they approached their peers, the intrapreneurs highlighted that top managers were more risk-averse when it came to “rescuing” the organization from digital disruption. They explained that they themselves had spent longer with the organization, meaning that they felt a stronger sense of identification with it, and that this was why they took the initiative to protect the organization and why their peers should join/support them. In this way they distinguished themselves (intrapreneurs and their peers) as the real ‘stakeholders’ of the business, who cared more than the top managers about the long-term survival of the business. Thus, they believed they would take risks to cross organizational boundaries and team up with others in order to innovate. In their negotiations

with top managers, the intrapreneurs nevertheless stressed that employees lower down the organization already had a full workload, so they asked for additional support and extra resources for their innovations.

At TPORT, there were relatively few barriers preventing intrapreneurs from receiving the resources they needed to develop their ideas. Intrapreneurial teams and individuals received various forms of support from the organization, including training and recognition. Normally they were able to communicate easily with top managers to obtain approval for adaptation projects. A TPORT's intrapreneur reflected on this:

*“we have the Bridge. The Bridge is a meeting where the board tells us what they are doing. All the employees can come to the Bridge.... we come together with the top 80 people from the organization, mostly managers, and we share what is happening in the organization and how we can deal with it. ... We have separate meetings with the board and a couple of managers. Those are the managers who have a lot of impact on what happens in the organization. For example, ... the commercial managers are in that group. They also challenge each other [about] what happens, how can we deal with it, and do we need to adjust our existing plans, or can we just carry on the way we have started.”*

In the qualification process, top managers supported the adaptation projects, providing that intrapreneurs were able to demonstrate that they were making progress for example by acquiring the right people for the projects. The quotation below provides an example of one such interaction between top managers and intrapreneurs at TPORT. An intrapreneur said:

*“After we did the analysis ..., then the board said ‘Okay. We’ve got to do this, but we need somebody,’ because we were in the market of Germany which was largely growing. ‘We need somebody with a background in German logistics to come and help us.’ Then I called one of my friends in the market: ‘So, this work needs to be done. Do you know somebody?’ We found somebody through my contacts in the market and we met, and we clicked, and we started to work on it. He was German, I was Dutch. .... He was a former managing director of [company name] and he was a consultant, and we would basically do it with the two of us thinking about the concept, because that is the most important thing—*

*the concept that you have a storyline that nobody can shoot holes in. A storyline needs to be 100% convincing.”*

The fit between the cognitive frames of the intrapreneurs running an adaptation project and the managers governing the resources was central to the qualification and negotiation process. Intrapreneurs strove to prove their adaptation projects did not cross identity boundaries: neither of the established OI nor of the meta-identity. Key resource holders, on the other hand, were careful to select feasible projects that would help to clarify the future of the business. In the iterative negotiations between the top managers and the intrapreneurs, top managers were concerned about the result of the progress. For the projects to keep receiving the support, the progress should help clarifying the future identity and be in line with the meta-identity. The result of the intrapreneurs’ interactions with their peers as well as with top managers determined whether and how the adaptation projects would be established. This process ended up establishing their new sub-identity and they were thus able to make decisions on how to structure as viable business components.

#### **4.7 Establishing adaptation project’s output: Adapting OI**

Once an adaptation project had successfully passed the initial road tests and grew to be recognized, top managers and intrapreneurs had to decide how to structure it as a new business. The projects were either established as an integral part of the current business or were organized as separate units. The relationship between the established OI, the meta-identity, and the projects’ sub-identities influenced how the projects were established.

The adaptation projects mostly had native sub-identities in the eyes of the critical resource holders (who had defined the meta-identity) and intrapreneurs. However, the type of organizational meta-identity was a criterion in decisions on structuring. We identified two types of meta-identity: additive and transformative. An additive meta-identity represented a porous boundary between the established OI and the emerging parts. As the informants conveyed implicitly and explicitly, “landlord plus” and “solver of the port’s big-problems”—the metaphors of TPORT’s future identity—refer to a stable, established administrative business with new components. They wanted to extend the established business by playing an active role in transforming the entire ecosystem of the TPORT’s

business. TPORT's managers recognized that their business needed a technological element. Therefore, it was easier to add a new technological identity element to the business to facilitate that change. Our informants reported barely any resistance to adaptation to digital. One exception to this was the strategies of TPORT's previous CEO, who refused to acknowledge any need for adaptation. Within the organization itself, it became widely accepted that it was on its way to becoming a "landlord plus." We found that this completely open approach to innovation—represented in the organization's additive meta-identity—could flex cognitive boundaries and facilitate identification with and adoption of the adaptation projects.

ELECT's managers by identifying their firm an "energy network plus" and "energy value constellation leader", were envisioning the emergence of multiple independent businesses (spin-offs from ELECT and other players), which ELECT would lead. Although the adaptation projects were well received in both ELECT and TPORT they were developed and housed in separate organizational structures: an incubator and an accelerator for TPORT, and a rather isolated new product development department for ELECT. The adaptation programs were intended to expand the existing business by opening up the business to complementors, and the changes at the core of the established organization were marginal.

The transformative meta-identity metaphor denoted a more nuanced and complex relationship between the established and the emerging OI. Transforming HURAM was going on through a program called "Tech and Touch" which was an example of using a transformative meta-identity. "Tech and Touch" referred to the aim of the firm to adopt digital (and become similar to the challengers such as LinkedIn), while they kept providing services to their clients in their break-and-mortar business. There were no clear boundaries between the old and new HURAM businesses. The firm's top managers encouraged intrapreneurs to transfer their newly developed knowledge and capabilities on "Tech" to other parts of the organization organically. New businesses generated by intrapreneurs were become embedded (for instance, through the adoption of new key performance indicators) in the existing organization, sometimes without involving the top managers. The adaptation projects and programs helped to transform the existing organization from within, and the

meta-identity hardly suggested required any crossing of boundaries compared to the other two firms in this study.

At HURAM, the intrapreneurs had to embrace changes in their business from “staffing” for corporates to “navigating” human resources. The digital-driven logic was gradually becoming accepted because of its rising popularity in the market. In this logic individuals were recognized as clients instead, which differed from the established business logic of HURAM that they were called candidates. This change in rhetoric was because HURAM noticed a growing trend of freelancing. Accordingly, they treated individuals, i.e., freelancers, also as business client. To accommodate the change in their identity and operations, top managers of HURAM returned to a motto used by the organization’s founder—“shaping the world of work”—in their communications about the “Tech and Touch” program. The capabilities required to navigate human resources (e.g. managing freelancers’ administrative works) could be completely different from those needed for only staffing for corporates. However, when the new capabilities were created from the bottom up, people within the organization, including top managers and other middle and line managers, welcomed the adaptation projects most of the time. Indeed, these projects had the advantage of having been tested and approved by the HURAM (prospective) customers beforehand. Hence, when the market and new capabilities overlapped, the adaptation projects were integrated into the current business.

The outcome of the innovation processes in all three firms was a pluralized OI containing innovations that either transformed the current established identity or created a new (sub-)identity within the meta-identity boundaries. Each adaptation project either enriched the established OI or clarified the meta-identity. When a new sub-identity associated with a project became widely accepted in the organization, the project became an integral part of the organization. When there was little acceptance of a sub-identity within the organization (and no integration context for the project), the project became a (semi) separate, external organization.

There were similarities and differences in the behavior of the intrapreneurs adaptation projects across the three firms. A shared perception across hierarchical levels

about the changes in the environment and their effects on the organization motivated top managers as well as intrapreneurs to begin to adapt to the change. But due to their different cognitive concerns—“who we are (becoming)” for top managers and “what we do” for intrapreneurs—they responded to the change differently. At TPORT, a new CEO made the organization go all-out for adaptation. At ELECT, while top managers and intrapreneurs backed the adaptation process, most of the organization had little empathy with the intrapreneurs in their attempts to achieve adaptation goals. The nature of the consultancy business at HURAM suggests there was little dependence between the middle and line managers. We present information about the differences between our firms in terms of OI, meta-identity, technology orientation, drivers of adaptation, and organizational structure in Tables 4.4 and 4.5.

#### **4.8 OI-based theoretical model of firm’s adaptation**

In the previous sections, we showed the process by which established organizations overcome cognitive inertia in relation to adaptation, caused by inflexibility of identity. Our findings reveal a complex, multilevel process of entrepreneurial adaptation. The data structure in Table 4.3 represents essential observations and theoretical concepts that we found in our inductive study. Most of the concepts are emergent. Our theoretical model now includes the concepts and the relationships that we discovered between them. In this section, we present our OI-based model of firm’s adaptation to major technological change, as illustrated in Figure 4.1, which we developed by analyzing our data from an embedded multiple case study.

To represent our complex model as clearly as possible, we used horizontal and vertical axes. The horizontal axis indicates the behavioral sequence of the model: context, behavior, and outcome. The vertical axis illustrates the parts of the process relating to dimensions of identity: identity core (cognition and thinking) and identity behavior (action). The non-numbered box represents the context that motivates the adaptation, which is not a central finding of our research. Boxes with dashed borders denote the organizational levels associated with the concepts in our model: top managers and intrapreneurs. Beginning from the left, our model first depicts changes in the external environment and stakeholder

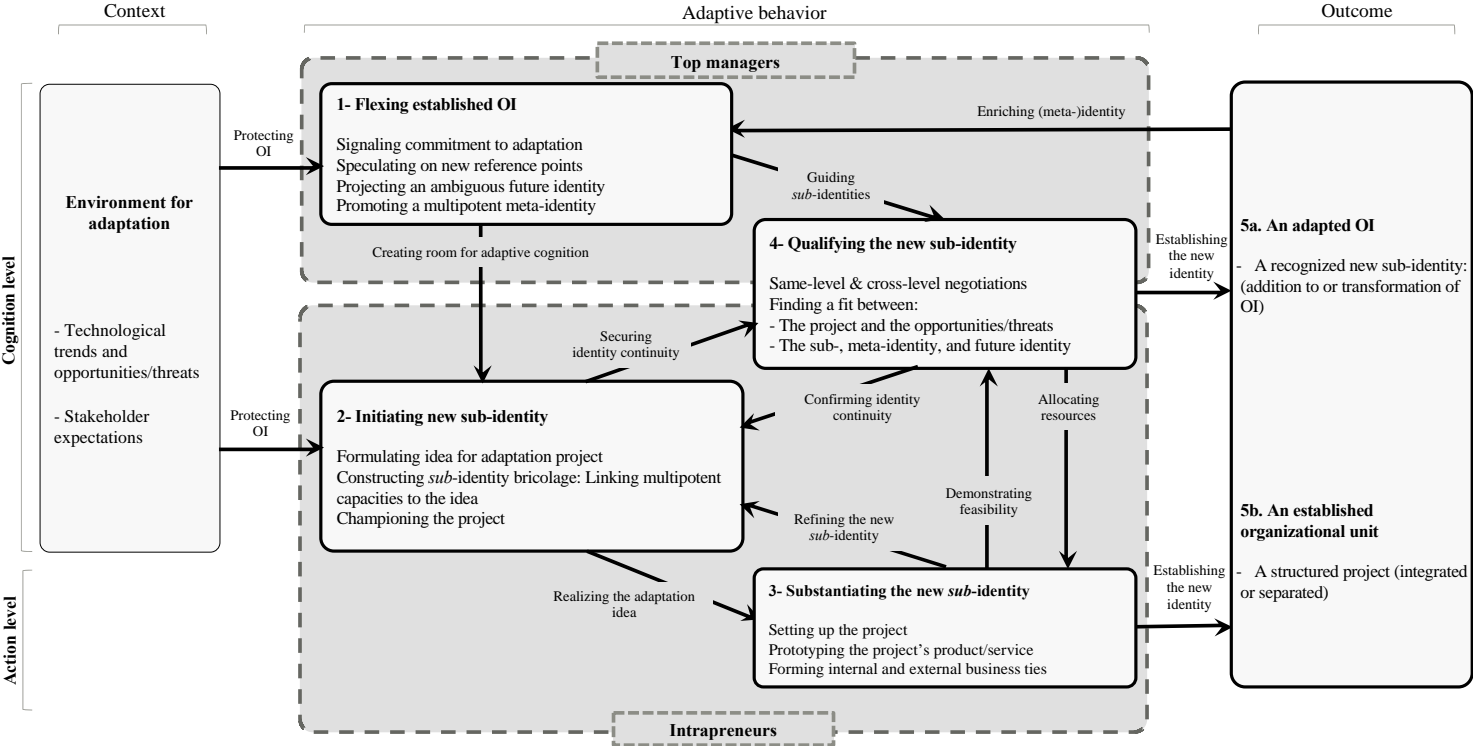
expectations as the stimulus for incumbents' adaptive behavior. Box 1 shows the actions taken by entrepreneurial top managers to flex OI—in relation to new technological opportunities.

Box 2 depicts how intrapreneurs behave. The intrapreneurs make a case for adaptation projects by linking them to multipotent capacities, constructing sub-identity bricolage for the projects, and championing their adaptation ideas. As illustrated in Box 3, intrapreneurs subsequently realize their ideas by putting structures in place for the project, prototyping their cases, and building ecosystems of internal and external ties for the projects. Between Boxes 2 and 3, there is a feedback loop through which the adaptation ideas are refined and implemented.

In response to the activities presented in Boxes 2 and 3, managers of different organizational hierarchical levels engage in negotiation for evaluating the adaptation projects to decide whether to allocate resources to them. This type of negotiation occurs throughout the adaptation project lifecycle with differing degrees of formality and either at the same level or across levels of the organizational hierarchy. By substantiating the adaptation projects, the intrapreneurs convince key organizational resource holders that their initiatives are keeping with the organization as it-is (meta-identity and current OI) or as it-is-becoming (meta-identity and future identity). They also provide evidence that their ideas are feasible and useful in either pursuing opportunities or avoiding threats. These activities are presented in Box 4. Box 5 represents the final activities: adapting business as the outcome of the adaptation process. After the sub-identities have been officially recognized, organizations place the projects that carry the sub-identities either within or outside their current structure. This structural decision depends on the type of innovation that results from the adaptation projects. Innovations that enrich OI are placed within the existing organization, while those that enrich the meta-identity are structured separately, in a new organization.

In the next section we provide a more in-depth theoretical discussion of the multilevel, dynamic, and complex process of identity-informed adaptation by incumbents.

Figure 4.1– OI-based model of firm’s adaptation to major technological change



## 4.9 Discussion

Our findings and our model provide first-hand insights into the cognitive strategies that firms can employ to adapt in the face of major technological change. Prior research has documented various strategies that can be used to adapt an organization and its identity. Utilizing a temporary transition identity is one such strategy (Clark et al., 2010). Gioia, Schultz, and Corley (2000) theorize how leaders adapt (the identity of) an organization by understanding and communicating a different meaning from the same label of OI. Other strategies that may be used include limited experimentation with identity (Fiol, 2002), returning to a more applicable identity from the past (Schultz and Hernes, 2013), selective forgetting of undesirable components of identity (Anteby and Molnar, 2012), creating an identity-dissemination discourse (Perra et al., 2017), and changing the way innovation is implemented to resolve the identity tensions (Brunninge, 2007). Sasaki, Kotlar, Ravasi, and Vaara (2019) have also shown how firms adopt innovations by interpreting the content of their identity astutely.

We add to identity and adaptation research by providing answers to the question of how established firms address the cognitive rigidity resulting from their established identities. We contribute to the literature by developing a comprehensive model of the process by which incumbents adapt to technological discontinuities in their environment in order to seize the opportunities offered and avoid related threats. These processes are based on a pluralistic identity strategy: flexing OI, initiating sub-identities, substantiating new sub-identities, qualifying new sub-identities, and establishing new OI. By examining these various processes, we can see how intrapreneurs at different hierarchical levels think and act (Ott et al., 2017) over time as they adapt their organization and business to exploit the abundant opportunities that stem from a technological revolution.

Our model is in accordance with the existing strategy process models. It is consistent with certain tenets of the strategy process, namely that middle and line managers have agency and independence in strategy making and implementation. Burgelman (1991, 1994) introduces intra-organizational ecology as an independent but parallel process to firms' formal strategy process. There has been considerable discussion of strategy process (Bartlett

and Ghoshal, 1993; Bhardwaj et al., 2006; Burgelman, 1983a, 2002; Burgelman and Grove, 2007; Kannan-Narasimhan and Lawrence, 2018; Lovas and Ghoshal, 2000). To elaborate on the intra-organizational ecology of strategy making, Lovas and Ghoshal (2000) focus their attention on organizational leadership at the top management level, and Kannan-Narasimhan and Lawrence (2018) look at the bottom-up strategy process. We contribute to this by presenting a model of a unified strategy process for adaptation by which managers from all hierarchical levels participate proactively in both decision-making and implementation. Our cases demonstrate that organizations combine top-down (induced) and bottom-up (autonomous) strategy processes when environmental ambiguity and uncertainty are at their peak and there is an enormous number of technology-based opportunities.

The theoretical model that we develop illustrates how incumbents cope with ‘the often tense’ situation of adapting an established identity. The tension stems from the new identity’s potential threat to the stability, continuity, and psychological anchoring provided by an established OI (Gioia et al., 2013). Fiol’s (2002) model of a linguistic solution to the paradox of OI stability and change suggests a disruption to OI and a subsequent re-building. Research on paradox argues that employees prefer consistency (Cialdini et al., 1995), and that if faced with inconsistency, they will react by striving to restore consistency (Smith, 2014). Studies in this area highlight the need for strategies that will promote consistency (Huy, 2002). Gustafson and Reger (1995) suggest that, in a time of change, OI creates a sense of stability that serves as a psychological anchor. Both stabilizing and adaptive effects of identity work tend to be beneficial for leaders. We develop an in-depth account of how top managers and intrapreneurs manage such tensions in their organizations to gain stability and adaptation at the same time.

Our findings provide grounded evidence of the usefulness of promoting a meta-identity along with an ambiguous but appealing vision of the future. In our firms, meta-identities provided fertile grounds for the emergence of future identities, but these were hazy in nature, because of the sheer number of possible future directions. Constructing sub-identities for adaptation projects gradually enables organizations to adapt to new technological settings. The meta-identity creates fuzzy borders for an organization’s self-definition. This fuzziness reduces the potential for tensions when an idea may be perceived

as being at the edge of or outside the borders of the organization's current identity. The inherent uncertainty of the meta-identity motivates intrapreneurs (Mueller et al., 2012) to define its borders more clearly by putting their new ideas into operation and by combining identity resources (Dalpiaz et al., 2016; Glynn, 2008; Kroezen and Heugens, 2012). By constructing a sub-identity bricolage, the intrapreneurs also reduce concerns about the break with the present OI (e.g., Anthony, and Tripsas, 2016; Oliver, and Cole, 2019). Meta-identity and identity bricolage can help managers avoid potential conflicts between the identity and innovations as they can provide converging and abstract goals for the organization (Cronin and Weingart, 2007; Newell and Simon, 1972).

Our theoretical model helps to provide a better understanding of the relationship between identity and adaptation. We elaborate on how OI segmentation is useful for adaptation. Studies that deal with how identity can be a cognitive barrier to adapting to technological change mostly study OI as a single monolithic collective perception. What our findings show is that there are important nested and multiple sub-identities (Ashforth et al., 2011; Pratt and Foreman, 2000), identity narratives (Brown, 2006) and identity dimensions (Ashforth et al., 2008). This inherent flexibility of OI turns it into a valuable resource for overcoming cognitive inertia. Raffaelli, Glynn, and Tushman (2019) identify different effects of top managers' perceptions concerning "who we are" and "what we do." Our study has also nuanced findings: when ambiguity levels rise because of a major technological change, top management dedicate more attention to dealing with the issue of "who we are" as an organization (i.e., identity content), whereas middle and line managers address the issue of "what we do" (i.e., identity behavior).

Our findings complement recent theoretical developments that shed light on how a bounded setting for organizational identity work can help OI adaptation. Assuming the entire organization as the setting for identity work, we suggest that top managers can offer an abstract perception of "who we are (becoming)" and let intrapreneurs come up with answers to the question of "what do we do?" To do this, the intrapreneurs construct a new sub-identity bricolage. The new sub-identity is interwoven into the intrapreneurs' activities for developing adaptation projects. Focusing on *becoming* through *doing*, Bojovic, Sabatier, and Coblenz (2019) also document how firms' experimentation with "what they do" in

separate structures can inspire their emerging identity, which then replaces their existing identity. We complement this view by theorizing about an organization-wide identity work instead of identity work only in the experimental spaces.

#### **4.10 Directions for future research**

In qualitative research, there are a number of limitations. When using interview data, over-reliance on informants' memories can be one limitation. In this research our data comes from multiple embedded cases, each covering a different time period. We also collected data from internal and publicly available documents to corroborate our interview data and validated our data and findings using several focus groups. We took these steps to minimize the risk of retrospection and over-reliance on informants' memories.

Regarding the generalizability and transferability of our findings, it is worth noting that our cases operated in entirely different settings and began their adaptation process at different times and in different conditions. The process and the underlying pluralistic identity strategies are of relevance for many other incumbents to varying degrees. In practice, in industries with a more turbulent environment and a less certain future, the process may be smoother. One next step is to test the findings of this study empirically. Below, we suggest other directions for future research.

Collective beliefs and actions constitute OI. Established identities can be a source of such a lock-in as they channel information inflow to organizations. On the other hand, we know that organizational mottos, managers' rhetoric, and organizational narratives a source of identity dynamism in an organization. In this research, we examined organizations with identity metaphors that had static connotation: landlord, and asset manager. Thus, studying established organizations whose identity metaphors have more dynamic connotations could be a direction for future research.

Our theory agrees with theories of legitimizing. Our model covers a series of steps discussed by Bitektine and Haack (2015): perception (flexing the OI and defining the adaptation project), judgment (qualifying the adaptation project), and action (substantiating the adaptation project and adapting the organization). Also, at an organizational level, we

observe that the locus of validation of new sub-identities remains within an organization when the environment is not stable, although external sources of legitimacy, e.g., approval from customers, play a role in the validation process. Mapping Bitektine and Haack's (2015) model to ours could provide opportunities for future research. For instance, future empirical studies could examine how the identity materials that are used in constructing sub-identity bricolage create legitimacy and provide better access to organizational resources: They could investigate, for example, whether there is a significant difference in the effect of sub-identities inspired by challengers, or that are related to particular operational or administrative functions or individuals. We also observed and theorized about how hiring new management sends signals to organization and how those signals help (identity) adaptation. Another avenue for future research could be to examine how the identity–adaptation relationship is affected by changes in key human resources and capital and by the inclusion of these individuals (formal and informal leaders, stars and celebrity members, symbolic hires, etc.) in sub-identity bricolage. This could extend research on the effects of weight and voice of managers in attracting organizational attention (Bouquet and Birkinshaw, 2011) to an emerging sub-identity.

#### **4.11 Conclusion**

Our purpose was to provide a multilevel and longitudinal account of adaptation of incumbent firms to revolutionary technological change. We therefore investigated how incumbents reacted to the changes brought about by the digital revolution. The firms we studied were from industries that had not undergone much fundamental change in recent history. All in all, our essential contribution is that we connect up theories about the strategy process, on the one hand, and managerial and organizational cognition on the other, in order to explain how established and large organizations adapt to major technological change. Recent research on OI has brought the role of identity dimensionality to the fore. Our multilevel theory also incorporates identity pluralism in terms of multiple standalone OI components and narratives, i.e., meta- and sub-identities, that can be leveraged to help an organization adapt. We thus provide an integrated and cognitively rich model that shows both the top-down and bottom-up strategy processes at work in adapting firm.

## **Chapter 5: Conclusion**



## 5 Conclusion

The studies that I presented in this dissertation aim to answer questions about how managers think and act (Ott et al., 2017) to navigate their organizations in an uncertain environment to adapt to an ‘encompassing technological change’ (Nagarajan and Mitchell, 1998) in different institutional settings (North, 1990, 1991). We built on literature covering the relationship between organizational capabilities, managerial cognition, and adaptation. By taking heed of the link between managers’ and organizations’ capabilities and cognition, we elaborated on strategy-making complications for adaptation given divergent forces of supply and demand in different institutional settings. To do so within the boundaries of a Ph.D. project, we addressed

1. the type of organizational capabilities to which incumbents need to be able to adapt,
2. how the capabilities relate to managers’ cognition, and
3. how managers’ cognitive activities help their organization adapt.

In the first study, we explored how a specific organizational capability—*misalignment* capability, which enables an organization to accommodate managers’ competing interpretation of the future of emerging technology, facilitates incumbents’ response to technology-driven market heterogeneity. Next, we examined how the organization’s cognitive capabilities, e.g., absorptive capacity, and the manager’s cognition play a role in the adoption of a new platform technology. We accounted for the effects of country-level characteristics, specifically by testing the contingency effect of countries’ regulatory system quality and national temporal orientation on the relationship between the organizational absorptive capacity and the manager’s attention. In the third study, we developed a theory that explains strategies to utilize existing organizational capabilities and cognition to adapt. We focused on organizational identity as it is the cognitive frame that controls how organizational capabilities and cognition work. Managers use a pluralistic identity strategy to motivate change projects to adapt their established business. Together, these studies shed light on the unnoticed or less attended aspects of the strategy process and managerial and organizational cognition in the digital era.

## 5.1 Contributions of the dissertation

This dissertation's main contribution is providing evidence for the utility of a pluralistic strategy and the microfoundational underpinnings of a pluralistic strategy-making process in highly uncertain and ambiguous environments. Here, strategy pluralism means that incumbents pursue parallel strategic directions, rather than developing a focused, predetermined one. Strategic pluralism deviates from the logic of scenario planning in that pluralism suggests equal attention to, and simultaneous investments in, parallel scenarios of the future. The emergence of 'encompassing technological change' (Nagarajan and Mitchell, 1998) constrains managers' and organizations' ability to predict the future. Our studies provide evidence and develop theories of how managers devise pluralistic strategy-making processes and rely on pluralistic strategies to survive in such situations.

Inspired by studies that indicate the boundary conditions of focused and aligned strategy and organizations (Le Breton-Miller and Miller, 2015; Dattée et al., 2017; Khanna and Palepu, 1997; Poulis and Poulis, 2016), we theorized about managerial and organizational capabilities, cognition, and cognitive actions required to design and benefit from multi-focused strategy. Prior studies of managerial and organizational cognition have signified the importance parallel search (Leiponen and Helfat, 2010), cognitive differentiation (Smith and Tushman, 2005), fragmented sensemaking (Balogun and Johnson, 2004), distributed attention (Ocasio, 1997, 2011), and pluralistic organizational identity (Pratt and Foreman, 2000) for strategic change. Researchers of strategy also have long been documenting the contributions of bottom-up strategy processes to the firm's performance (Burgelman, 1983b; Floyd and Wooldridge, 1992; Heyden et al., 2017; Huy, 2002; Kannan-Narasimhan and Lawrence, 2018; Lovas and Ghoshal, 2000). We added to the literature, primarily by blending theories from these two research streams. Extant research recognizes the 'strategic cognitive lock-in' (Burgelman, 2002) as a barrier in front of organization-wide strategizing activities. We explored how organizations can break the lock-in effect by unifying 'induced' and 'autonomous' strategy processes (Burgelman and Grove, 2007) when there is a lack of visibility of the future (Dattée et al., 2017). In this kind of environment, managers cannot develop and communicate a clear strategy; therefore, they lead 'emergent strategy' processes.

In study 1, we identified misalignment capability as a source of survival. We elaborated on underlying cognitive processes to show how multi-focused organizational attention helps an incumbent maintain its market position during industry disruption. We documented how frequent alteration of strategic directions, structure design, and resource management practice enables the incumbent to lead a complex innovation process of a platform technology development. By this, we complemented theories of alignment and fit as we documented that internal alignment might fall short in coping with divergent market forces. We also enhanced the theories of MNEs by clarifying the paradoxical aspects of an MNE's global integration and local responsiveness during a technological disruption.

In study 2, we joined the conversation on the microfoundation of international business research. We investigated how managerial and organizational cognition explains the variation of platform technology adoption in different national regulatory and cultural contexts. We extended the existing theories of cross-country technology adoption, using macro- and micro-level concepts. We specifically disentangled how regulatory systems' quality and nation's long-term orientation shift the relative importance of absorptive capacity and managerial attention for technology adoption. This result highlighted a boundary of the classic theories of the international adoption of technology by recognizing a significant role for firm-level characteristics in the early adoption of a platform technology. We also tested the situatedness of managerial attention to a technological change by examining two different contexts: organizational and national. We found that organizational context provided by absorptive capacity can override the effect of countries' regulatory and cultural contexts in directing managerial attention towards the new platform technology. Through this research, we contributed to international business literature on digital platform technology adoption.

In study 3, we focused on a cognitive barrier of adaptation to technological change: organizational identity rigidity. By looking at how incumbents succeed in initiating adaptive projects, we theorized about how organizational identity can foster adaptation to a revolutionary technological regime. Tapping into existing conceptualizations of identity segmentation and openness to various narratives, we recognized that middle and front-line managers leverage an existing pluralism in the organizational identity by constructing a sub-

identity bricolage to advance their adaptive projects. We also identified how top managers could guide and promote middle and front-line managers' change projects by pluralizing the organizational identity even more though propagating a meta-identity. In this way, we developed a model of strategy process informed by organizational identity work. Our third study contributed to the literature on strategy process, organizational inertia, and organizational identity theory by initiating a mutual conversation between them. We also theorized about how to overcome the cognitive lock-in effect caused by a rigid organizational identity. The result was a theoretical model that unifies autonomous and induced strategy processes. Our study contributed to the theories of paradoxical management by documenting how managers could contain tensions caused by identity stability and change paradoxes.

New business problems of the digital era call for new theories. This dissertation contributes to the literature by explicating the relationship between organizational capabilities and managerial cognition in the process of adaptation. The three studies' findings extend our knowledge by theorizing about underexplored domains of incumbents' adaptation: organizational misalignment capabilities, microfoundations of cross-country technology adoption, and pluralistic identity strategy.

- 1- Organizational misalignment capability (Gulati and Puranam, 2009) is a dynamic capability (Teece, 2007) that enables multinational firms to cope with technological disruption (Gilbert, 2005) while managing the paradoxical tensions (Schad et al., 2016; Smith and Tushman, 2005) of such a response in a global context (Ghoshal and Nohria, 1989; Nohria and Ghoshal, 1994, 1997). We clarified the mechanisms through which demand-side divergent forces affect incumbents strategies (Adner and Kapoor, 2010). We complemented existing theories by uncovering how incumbents accommodate contradicting visions of the future, a combination of deployment strategies (Karim and Capron, 2016), and dynamic design of the organizations' structure (Boumgarden et al., 2012) to deal with the digital revolution.
- 2- We joined and bridged between isolated conversations in strategy and international business on the complexities of cross-country adoption of digital platform technology (Nambisan, Zahra, et al., 2019) and microfoundations of international business strategy

(Coviello et al., 2017; Foss and Pedersen, 2019). We offer new insights into the combined effects of institutions, organizations, and managers on technology adoption at a cognition level. We tested hypotheses on the moderating effects of regulations (Blind, 2012) and long-term orientation culture (Hofstede and Minkov, 2010) on the organizational process of platform technology adoption. Testing for the effects of path-dependence and agency (Hutzschenreuter et al., 2007; Thietart, 2016), we provide evidence of how path-dependent capabilities trigger managerial agency to compensate for shortcomings of institutions and drive platform technology adoption in countries with weak institutions. We offer a multi-level theory of cross-country technology adoption that complements the classic model of technology lifecycles (Galang, 2012; Vernon, 1966). We also answered the recent calls for investigating institutional voids and their effects in international business (Doh et al., 2017).

- 3- By conceptualizing about pluralistic identity, we built a cognitively rich theory of adaptation that accounts for identity dimensionality, multiple organizational identities, and identity narratives (Ashforth et al., 2008, 2011; Ashforth and Mael, 1996; Brown, 2006; Corley, 2004; Foreman and Whetten, 2002; Pratt and Foreman, 2000; Whetten and Godfrey, 1998) in large and established organizations. We selected a context with high uncertainty and ambiguity (Navis and Glynn, 2010; Santos and Eisenhardt, 2009). We provide evidence of how organizational identity, a known source of organizational inertia (Levitt, 1960; Prahalad and Bettis, 1986; Tripsas, 2009), can motivate adaptation (Corley et al., 2011). Our grounded theoretical model shows how top managers and intrapreneurs contain the tensions of identity stability and change paradox, respectively, by pluralizing their organizational identity and constructing a bricolage identity for their adaptation projects. Thus, we extend and complement recent theorizing efforts on adaptation (Raffaelli et al., 2019), organizational identity (Cloutier and Ravasi, 2019), and strategy process (Kannan-Narasimhan and Lawrence, 2018).

Our theoretical contributions also come with empirical contributions. We collected unique qualitative and quantitative data of how an MNE and its international customers adopt a platform technology. We combined this dataset with publicly available data to increase our research quality and test the multi-level model of technology adoption (Eggers and Park, 2018). We also built theory grounded in longitudinal data in a pluralistic setting

of strategy making (Jarzabkowski and Fenton, 2006) for platformization in private and public sectors.

## **5.2 Managerial implications**

Strategic management literature recommends internal alignment and a focused strategy for strategic change. Based on the evidence presented in Study 1, Chapter 2, we recommend managers make their firms flexible by embracing internal misalignment and adopting a multi-focused strategy when their organization is under pressure by divergent demand for emerging technology. Technological uncertainty in the early stages of the technology development calls for extraordinary flexibility to enable the incumbent to maintain its market power facing disruptive technological forces. The flexibility is obtained by paying attention to and investing in parallel technology development paths. The required capability to be flexible comes from devising an accommodating market strategy, alternating different structural designs, and adopting different resource management practices. By that means, managers are more likely to survive disruption and be able to navigate their business in the conditions of poor visibility of the technological future, although their profit margins may decline for some time.

We knew that organizations with a sizeable ability to identify and apply new technologies are more likely to adopt revolutionary technology. According to Study 2, managers have a critical role in technology adoption, especially in the less prepared institutional contexts. When a national regulatory system—i.e., regulations, government efficiency, and rule of law—and culture play against the proactive adoption of new platform technology, managers' sufficient and sustained attention to new technology can effectuate organizational capability to adopt the technology. Thus, understanding the fact that the institutions, e.g., culture and regulatory systems, are stable, international partners or policy-makers who are interested in faster adoption of the new platform technology can assist local incumbents in two ways: First, with improving the technological capabilities of the local incumbents, they accelerate new platform technology adoption. Second, by directing managers' attention to the technology, they can offset the adverse effects of unprepared institutions and expedite adopting a new platform technology.

Strategic management scholars have identified benefits of clarity in the image of the future for motivating the organization to change. Sometimes attaining such clarity is impossible. In study 3, we found that managers also portray an ambiguous image of the future to overcome identity-based cognitive resistance against transforming the business. They also motivate their organization to change using organizational identity when the future is uncertain. Leaders can communicate a meta-identity that is abstract but relatable by organizational members to help their organizations accommodate innovative ideas that otherwise can receive "it is not our business" responses. The meta-identity creates a positive mindset toward transformation as well. Managers are motivated to accept innovative projects that can be defined in their organizational identity's abstract and expanded boundaries to reduce the ambiguity. Our study shows that when intrapreneurs negotiate their innovative projects with strong links to current sub-identities, they can secure support. Our findings provide evidence for constructing a bricolage identity to overcome the cognitive barriers against the adaptation of incumbents.

Through the studies presented in this dissertation, I offer new insights into how managers can adapt their organizations in the digital era. Because of today's different business requirements, managers need to reconsider the business logic of the pre-digital era. Firms should become more flexible and versatile by developing misalignment capabilities, paying multi-focused attention to their environment, and embracing pluralistic identity to be able to adapt. Our studies suggest that firms have the potential to do so, even when institutions resist against their strategies. This, of course, comes with extra costs that ensure their survival.

### **5.3 Limitations and avenues for future studies**

The studies of this dissertation are subject to methodological and operational limitations. For example, a purpose of qualitative research is to build theories based on revealing and extreme cases (Eisenhardt, 1989; Eisenhardt and Graebner, 2007); therefore, generalizability is hardly achievable (Thorngate, 1976). Two pieces of qualitative research are presented in this dissertation about how firms strategize under extreme conditions: Study 1, a MNE facing technological disruption, and Study 3, established incumbents leveraging

their organizational identity to adapt. Where it was possible, we extended generalizable conclusions. However, each of the studies has limitations that can motivate future research.

In Study 1, we elaborated on misalignment capability, which helps an MNE survive technological disruption and maintain its relations with existing customers, although its performance may decline. Future studies can elaborate on how such a capability can evolve over a longer period of time to yield sustainable performance. We specifically scrutinized an MNE's critical capabilities to survive disruption. Future studies can shed further light on the effects of competitive strategies among MNEs (Makhija, 2003; Peteraf and Bergen, 2003) for neutralizing disruptors' strategic actions and seeking advantage over them (Markides, 2008; Markides and Geroski, 2005; Volberda et al., 2018). Another path forward is to investigate strategies that accommodate both incumbents and disruptors in an emerging ecosystem (Jacobides et al., 2018).

In Study 2, we use a unique set of cross-sectional data of a representative sample of Cloud technology adopters worldwide. Analyzing the dataset illustrates a snapshot of an ongoing process of adopting a new platform technology within a global industry. We developed and tested hypotheses on the state of the new technology adoption in a specific period. Future research can test theories on the adoption process by collecting and analyzing longitudinal data of technology adopters. Within a focus on technology adopters, future research can answer questions related to more dynamic boundary conditions of platform technology adoption, e.g., market turbulence, macro and microeconomic measures, complementary technology developments (Cenamor et al., 2013; Rietveld and Eggers, 2018), and network effects (Gowrisankaran and Stavins, 2002; Parker and Van Alstyne, 2005).

Promoting a diversified view of identity that fosters innovation in an organization (Perra et al., 2017) can increase internal competition (Smith and Tushman, 2005). To control this side-effect, leaders employ structural and social integration mechanisms. Based on our analysis in Study 3, we proposed a socio-cognitive mechanism of integration: a widely accepted meta-identity can create a flexible cognitive framework for innovative cognitive activities. Constructing a sub-identity bricolage can represent the cognitive process through

which leaders can accommodate the tensions of organizational change. Future studies can explicate boundary conditions of such strategy by investigating the salience of organizational identity among different sub-units (Corley, 2004); existing reputation and image of the incumbents (Dukerich et al., 2002; Labianca et al., 2001); symbolic, social capital and trust within the organization (Li et al., 2020; Prato and Ferraro, 2018; Shah et al., 2019); and resource availability. We can understand dimensions of organizational identity that relate to who we are, what we do, why we do what we do, and how we do what we do (Ashforth et al., 2008; Cloutier and Ravasi, 2019). Various environmental triggers can prime the dimensions for organization members differently. “How these dimensions are stimulated and how the stimulated identity dimensions can foster or hinder adaptation?” can be two questions for future studies. In answering the second question, scholars can investigate the relationship between identity, as a cognitive frame, and attention, as a cognitive process, and its effect on incumbents’ adaptation to digital revolution.

## **5.4 Last words**

In the studies presented in this dissertation, we scrutinized the relationship between the firm’s adaptive capabilities and the managerial and organizational cognition and how they play a role in the adaptation of the firm. The studies presented here answer the calls for new research on business in the digital era. We did so by investigating business today and offering sophisticated, dynamic, and cognitively hot views of strategy and organization. By conducting these studies, we join theoretical discussions on the edge of strategy and organization research. The studies here set the agenda for future research to understand how managers navigate their organizations in the volatile, uncertain, complex, and ambiguous environment of the digital revolution. Overall, the research appreciates complex managerial cognition and organizational cognitive capabilities, and their agency in developing and employing digital technology in different institutional contexts.



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## Summary

Digital-driven technological innovations are revolutionizing our world. They provide business opportunities and, at the same time, face incumbent firms with various threats. Such firms have to cope with digital innovations to survive. Coming to grips with these innovations can be problematic, even for historically successful incumbent firms. For instance, we know insufficiently about how managers of different organizational hierarchical levels proactively play a part in the incumbents' adaptation in the digital time. Contributing to the literature on the incumbents' adaptation, I present three studies of the firms' strategy and organization in developing and adopting digital technological innovations in this dissertation. In the studies, I answer questions about organizational capabilities, managers' cognition (i.e., attention and identity), and how they (jointly) influence the firms' adaptation.

The first study is an in-depth case study of an incumbent firm's response to technological disruption in the early stages of technology development. During such time, managers have competing perceptions of the future, and the existence of the competing perceptions adds to technology development complications. The study conveys how a firm with "misalignment capability" and "multi-focus attention" can cope with its customers' divergent demands and avoid disruption. This study's findings show that, when faced with technological disruption and market heterogeneity, incumbents should eschew sustaining strategic alignment. Instead, they need to broaden the scope of their strategic experimentations to maintain a complex innovation process in order to survive. By doing so, they will preserve their strategic relationship with their key customers, although this may cause inefficiency. According to this study's findings, for a successful response to disruption, top managers need to follow inconsistent strategies simultaneously, experiment with various problem-solving methods and organizational systems recurrently, monitor the situations closely, assess the firm's performance frequently, and interrupt and change direction when necessary. In this study, the focus is on the capabilities required for surviving a technological disruption through adaptation that opens avenue for future studies. A path

forward for future studies can be to investigate the competitive strategies that MNEs can devise to neutralize disrupters' strategies or co-create the industries' future.

In the second study, the combined effect of macro- and micro-factors on platform technology adoption is scrutinized. Based on the analysis of unique and representative data of telecommunication operators worldwide, this study reveals that organizational and managerial cognitive capabilities can compensate for the effects of institutional shortcomings (i.e., a weak regulatory system and unconducive temporal orientation) in speeding up technology adoption. The findings support the idea that a greater absorptive capacity guides top managers' attention to the new technology to adopt the platform technology fast, despite weak national regulatory systems. The study results confirm that in short-term oriented national cultures, e.g., US, greater capabilities and managerial attention to the emerging platform technology increase the platform technology adoption speed. However, this effect is not confirmed for the long-term oriented cultures such as Germany. Future studies can scrutinize the effects of platform ecosystem characteristics on the speed of the adoption of new platform technology: ecosystem readiness, network effects, platform governance mechanisms.

The third study concentrates on the role of organizational identity in firms' digital transformations. Based on rich qualitative data of three Dutch incumbent firms, this study offers a model of how firms manage adaptation tensions, rooted in their rigid organizational identity, by reflecting on organizational identity, pluralizing organizational identity, leveraging identity pluralism, and extending organizational identity. This research shows that top managers and intrapreneurs together can manage the socio-cognitive tensions of adaptation in large established firms. Top managers communicate an abstract narrative of organizational identity (i.e., meta-identity) in line with a desirable ambiguous future identity to foster innovativeness. Intrapreneurs form sub-identities of their innovations so that they are more likely to receive support and resources. The sub-identities formed through constructing sub-identity bricolage can enrich the meta-identity and incrementally effectuate the firm's future identity. In this study, two types of meta-identities are also recognized with different implications for the firm's adaptation process. An avenue to follow-up this study is to investigate how managers can adapt identity-innovation concerning organizational

identity salience at different levels and functions. Researchers can also explore the relationship between cognitive processes such as attention and cognitive frames, such as identity, to better understand incumbents' adaptation.

In this dissertation's research, new models that take into account managers' agency in incumbents' adaptation are developed and tested and the boundary conditions of the current theories (e.g., path dependent capabilities and institutional view) in the digital era are identified. The results are discussed, and consequently, recommendations are provided for practice. Avenues for future research are also suggested.



## Samenvatting

Digitaal gedreven technologische innovaties veranderen onze wereld radicaal. Ze bieden nieuwe bedrijfsperspectieven en leveren tegelijkertijd bedreigingen op voor bestaande bedrijven. Deze bedrijven moeten leren omgaan met digitale technologische innovaties om te overleven. Het implementeren van deze innovaties kan problematisch zijn, zelfs voor bestaande bedrijven die al jaren succesvol zijn. Dit zorgt ervoor dat academici en mensen uit de praktijk geïnteresseerd zijn in het begrijpen hoe bedrijven met digitale innovaties omgaan. We weten vooral onvoldoende hoe managers van verschillende organisatorische hiërarchische niveaus proactief een rol spelen bij de aanpassing van de gevestigde exploitanten. Als bijdrage aan de literatuur over de aanpassing van de gevestigde exploitanten, uitgelicht ik drie individuele onderzoeken die gaan over de strategie en organisatie van bedrijven bij het ontwikkelen en toepassen van digitale technologische innovaties. In de onderzoeken, vragen over organisatorische capaciteiten, de cognitie van managers (d.w.z. aandacht en identiteit), en hoe deze het adaptieve gedrag van de firma's (gezamenlijk) beïnvloeden, worden beantwoord.

De eerste studie is een diepgaande casestudy en betreft de reactie van een bestaand bedrijf op technologische ontwrichting in een vroeg stadium van technologische ontwikkelingen. Gedurende die fase hebben managers concurrerende percepties van de toekomst, en het bestaan van de twee verschillende percepties zorgt voor vertraging en misverstanden bij de ontwikkeling van technologie. De studie laat zien hoe een bedrijf met “misalignment capability” en “multi-focus attention” kan omgaan met de uiteenlopende eisen van zijn klanten en hoe dit misverstanden kan voorkomen. De bevindingen van deze studie tonen aan dat wanneer bestaande bedrijven worden geconfronteerd met technologische ontwrichting en heterogeniteit op de markt, ze moeten vermijden om de bestaande strategische afstemming te behouden. In plaats daarvan moeten ze de reikwijdte van hun strategische experimenten verbreden zodat een complex innovatieproces in stand gehouden wordt om te kunnen overleven. Door dit te doen, behouden deze bedrijven hun strategische relatie met hun belangrijkste klanten, terwijl dit ook eventuele inefficiëntie kan veroorzaken. Volgens de bevindingen van deze studie moeten topmanagers herhaaldelijk experimenteren met verschillende probleemoplossende methoden en organisatiesystemen

en tegelijkertijd inconsistente strategieën implementeren om succesvol te reageren op verstoringen. Daarnaast komt er uit deze studie dat topmanagers de situaties in de maatschappij nauwlettend moeten volgen, de prestaties van het bedrijf regelmatig beoordelen en de koers van het bedrijf en strategische richting continue blijven analyseren en veranderen wanneer nodig. In deze studie ligt de focus op de capaciteiten die een bedrijf nodig heeft om een technologische ontwrichting te overleven. De bevindingen van deze studie openen wegen voor toekomstig onderzoek. Toekomstige studies kunnen zich focussen op de concurrentiestrategieën te onderzoeken die bestaande bedrijven kunnen helpen om de disruptieve digitale technologische innovaties te kunnen implementeren en strategische richtingen te veranderen om bijvoorbeeld de toekomst van de industrie mede te creëren.

In de tweede studie wordt het effect van macro- en microfactoren op de acceptatie van platformtechnologie onderzocht. Deze studie laat zien dat organisatorische en bestuurlijke cognitieve capaciteiten de effecten van institutionele tekortkomingen (d.w.z. een zwak systeem voor regelgeving en een weinig bevorderlijke tijdelijke oriëntatie) kunnen compenseren door het sneller toepassen van technologie. De bevindingen ondersteunen het idee dat topmanagers met een groot absorptievermogen de nieuwe platformtechnologie snel toe willen passen, ook wanneer het nationale systeem voor regelgeving zwak is. De studieresultaten bevestigen dat in nationale culturen waar veelal op de korte termijn wordt gericht, bijvoorbeeld in de Verenigde Staten, meer aandacht vanuit het management voor de opkomende platformtechnologie de acceptatiesnelheid van platformtechnologie vergroten. Dit effect wordt echter niet bevestigd voor de culturen die zich veelal op de langere termijn focussen zoals Duitsland. Toekomstige studies kunnen dit onderzoek uitbreiden door de effecten en kenmerken van platformecosystemen te onderzoeken op de snelheid waarmee de nieuwe platformtechnologie wordt geaccepteerd en geïmplementeerd binnen bedrijven. Dit kan ingaan op aspecten waaronder ecosysteemgereedheid, netwerkeffecten en mechanismen voor platformbeheer.

De derde studie richt zich op de rol van bedrijfsidentiteit in de digitale transformaties van bedrijven. In deze studie wordt gebruik gemaakt van kwalitatieve gegevens van drie Nederlandse bedrijven. Op basis van deze data wordt er in deze studie

een model gepresenteerd over hoe bedrijven omgaan met spanningen op het gebied van het adaptieve vermogen van bedrijven. Deze spanningen zijn geworteld in hun rigide organisatorische identiteit, door na te denken over de identiteit van de organisatie, de identiteit van de organisatie te pluraliseren, identiteitspluralisme te benutten en de identiteit van de organisatie uit te breiden.

Dit onderzoek toont aan dat topmanagers en intrapreneurs samen de sociaal-cognitieve spanningen van adaptatie in grote bestaande bedrijven kunnen beheersen. Topmanagers communiceren een abstract verhaal over de identiteit van de organisatie (d.w.z. meta-identiteit) in overeenstemming met een wenselijke toekomstige identiteit om innovatie vermogen en prestaties te bevorderen. Intrapreneurs vormen sub-identiteiten van hun innovaties, zodat ze eerder ondersteuning en middelen zullen ontvangen. De sub-identiteiten die gevormd worden door het ontwikkelen van “sub-identity bricolage” kunnen de meta-identiteit van het hele bedrijf verrijken en de toekomstige identiteit van het bedrijf stapsgewijs te verbreden. In deze studie worden ook twee soorten meta-identiteiten erkend met verschillende implicaties voor het aanpassingsproces van een bedrijf. Een manier om vervolgonderzoek uit te voeren, is om te onderzoeken hoe managers identiteitsinnovatie kunnen toepassen met betrekking tot de identiteit van de organisatie op verschillende niveaus en functies. Onderzoekers kunnen ook de relatie onderzoeken tussen cognitieve processen zoals aandacht en cognitieve kaders, zoals identiteit, om de aanpassingen van het bestaande bedrijf beter te begrijpen.

In dit proefschrift worden nieuwe modellen ontwikkeld en getest die rekening houden met de leidinggevend agency bij de aanpassing van gevestigde exploitanten en worden de randvoorwaarden van de huidige theorieën (bijv. ‘path dependence’ capaciteiten en institutionele visie) in het digitale tijdperk geïdentificeerd. De resultaten van de drie individuele onderzoeken worden toegelicht, vervolgens worden aanbevelingen gedaan voor de praktijk en als laatste worden mogelijkheden voor toekomstig onderzoek voorgesteld.



فن‌آوری ابری، هوش مصنوعی و پلتفرم‌های دیجیتال نمونه‌ی نوآوری‌هایی‌اند که محرک و اساس پیش‌رفت و دگرگونی در صنعت شده‌اند. فن‌آوری‌های دیجیتال برای صنایع فرصت‌های رشد و نوسازی خلق می‌کنند و بی‌توجهی به آن‌ها می‌تواند مایه‌ی شکست صنایع شود. به این معنی که صنایع مجبورند برای بقا در محیط رقابت، خود را با این فن‌آوری‌ها وفق دهند. از آنجا که چنین تغییری حتی برای صنایع موفق دشوار است، صنعت‌گران و محققان علاقمند شناسایی روش‌های مدیریت این تغییراتند. مؤلف این رساله‌ی دکتری از نظریه‌های موجود در این باره استفاده و محدودیت‌های آن‌ها را در شرایط انقلاب دیجیتال شناسایی کرده است. وی بر اساس مطالعات تجربی خود و هم‌کاران، نظریه‌هایی برای تبیین بهتر این مسائل ارائه و روش‌های مؤثری برای مدیریت شرایط جدید پیشنهاد می‌کند. این رساله از مقدمه، سه مقاله درباره‌ی مدیریت توسعه و جذب فن‌آوری و تحول دیجیتال، و جمع‌بندی این مقاله‌ها تشکیل شده است. قابلیت‌های ادراکی مدیران و سازمان‌ها محور نظری این مقالاتند. این مقاله‌ها نتیجه‌ی مطالعات کمی و کیفی مؤلف و هم‌کاران او از سال ۱۳۹۰ تا ۱۳۹۸ شمسی (۲۰۱۰ تا ۲۰۱۸ میلادی) در شرکت‌های معظم چندملیتی و محلی‌اند.

در مقدمه، مؤلف درباره ضرورت نظری تحقیقات منتشر شده در این رساله و ساختار آن‌ها توضیح می‌دهد. در مقاله‌ی نخست، که نتیجه‌ی مطالعه‌ی بلندمدت یک شرکت چندملیتی تامین‌کننده‌ی فن‌آوری مخابراتی است، نظریه‌ای بر مبنای مفهوم جدید «قابلیت ناهم‌راستایی سازمان (misalignment capability)» و اهمیت آن در زمان تخریب فن‌آورانه (technological disruption) ارائه شده است: شرکت‌هایی که این قابلیت را کسب و استفاده می‌کنند، می‌توانند با داشتن «توجه چندگانه (multi-focus attention)»، تقاضاهای متعدد، متفاوت و متضاد مشتریان بین‌المللی خود را برآورده کنند. در مقاله‌ی دوم، اثر ترکیب عوامل خرد و کلان در فرایند جذب فن‌آوری در شرکت‌های معظم محلی بررسی شده است. این مطالعه در دوره اولیه‌ی پیدایش فن‌آوری ابری در بیش از ۸۰ کشور انجام شده است. این مطالعه نشان می‌دهد که چگونه قابلیت‌های ادراکی سازمان‌ها و «توجه» مستمر مدیران آن‌ها به فن‌آوری، اثر منفی خلأهای نهادی (institutional voids) بر سرعت جذب فن‌آوری نو را جبران می‌کنند. در مقاله‌ی سوم، به نقش «هویت سازمانی» (تصور جمعی مدیران از فعالیت اصلی و ماندگار سازمان) در تحول دیجیتال سه شرکت بزرگ هلندی پرداخته شده است. در این مطالعه با استفاده از مفهوم جدید «هویت سازمانی متکثر (pluralistic organizational identity)» و مفاهیم مکمل آن، نظریه‌ای ارائه شده که نقش تکثر هویت در غلبه بر صلبیت (rigidity) سازمانی را تشریح کند. طبق این نظریه، هویت متکثر تقویت‌کننده‌ی کارآفرینی سازمانی و در نتیجه، پیش‌ران تحول دیجیتال است. مدیران می‌توانند در فرایندی شامل بازبینی هویت سازمان، تکثر هویت، اتکا به تکثر و استفاده از آن، و گسترش هویت، سازمان را متحول و فن‌آوری دیجیتال را جذب کنند. در بخش جمع‌بندی، مؤلف ابتدا فواید نظری و کاربردهای عملی مطالعات ارائه شده در این رساله را شرح داده، با برشمردن محدودیت‌های این مطالعات، مسیرهای جدیدی برای تحقیقات مدیریت پیشنهاد می‌کند.



## About the author

Mohammad Taghi Ramezan Zadeh (1979) is a PhD candidate in strategic management at Rotterdam School of Management, Erasmus University. He obtained his BSc in Engineering and his MSc in management. In 2015, he started his PhD with over a decade of experience as a consultant and a manager. From 2018 until January 2020, Taghi was part of Science-Based Business Center, Faculty of Science, Leiden University as a postdoctoral researcher. He is currently an Assistant Professor of Strategy at Amsterdam Business School, University of Amsterdam.



Taghi's research bridges managerial and organizational cognition and strategy theories to explain incumbent firms' adaptation to digital revolution. He has presented his studies at the leading conferences of management and organization research. The Strategic Management Interest Group of the European Academy of Management recognized his co-authored paper as the best paper of the Interest Group (2015). His paper on the identity strategies for the firm's adaptation (Chapter 4 of his PhD dissertation) was nominated for the best paper prize of the Strategic Management Society Annual Conference (2020). One of his co-authored papers is published in the Journal of Management Studies (Chapter 2 of his PhD dissertation). He has also developed and taught courses on strategy, (corporate) entrepreneurship, and digital transformation in MSc and BSc programs at Erasmus University, Leiden University, and the University of Amsterdam.



## Portfolio

### *Published paper*

Khanagha, S., Ramezan Zadeh, M. T., Mihalache, O. R., & Volberda, H. W. (2018). 'Embracing Bewilderment: Responding to Technological Disruption in Heterogeneous Market Environments'. *Journal of Management Studies*, 55, 1079–1121.

### *Work in progress papers*

Who is first to the Cloud?: A microfoundational study of cross-country adoption of platform technology. With Saeed Khanagha, Oli Mihalache, and Henk W. Volberda. Being revised for new submission. Target journal: *Research Policy*

We are going digital: Leveraging organizational identity pluralism for proactive adaptation. With Henk W. Volberda. Final considerations before submission. Target journal: *Strategic Entrepreneurship Journal*.

Metaphorical Twists and Turns: March and Simon's Organizations, the Attention Based View and Progressive Theorizing. Led by Joep Cornelissen and with Magdalena Cholakova and Henk W. Volberda. Revise and Resubmission at *Journal of Management Studie*.

How far is too far?: The effects of CVC-portfolio distance on parent's technological performance. With Niels Seiffert and Henk W. Volberda. Data collection stage. Target journal: *Journal of Business Venturing*

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Mohammad Taghi Ramezan Zadeh (1979) is a PhD candidate in strategic management at the Rotterdam School of Management (RSM), Erasmus University. He obtained his BSc in Engineering and his MSc in management. In 2015, after more than a decade working in the industry, he started his PhD at the RSM. His research bridges managerial and organizational cognition and strategy process theories to explain incumbent firms' proactive adaptation in the digital era.

Taghi has presented his findings in the leading conferences of management and organization research. The Strategic Management Interest Group of the European Academy of Management Annual Conference (2015) recognized a co-authored paper of him as the conference's best paper (2015). His research on the identity strategies for incumbent's adaptation (Chapter 4 of his PhD dissertation) was nominated for the best paper prize of the Strategic Management Society Annual Conference (2020). And one of his co-authored works is published in the Journal of Management Studies (Chapter 2 of his PhD dissertation).

Besides research, Taghi is passionate about teaching. He has given lecture in MSc and BSc programs at Erasmus University, Leiden University, and the University of Amsterdam. He was part of the Science-Based Business Center, Faculty of Science, Leiden University as a postdoctoral researcher from 2018 until January 2020. Now, he is an Assistant Professor of Strategy at the Amsterdam Business School, University of Amsterdam.

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P.O. Box 1738  
3000 DR Rotterdam, The Netherlands  
T +31 10 408 1182  
E [info@erim.eur.nl](mailto:info@erim.eur.nl)  
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