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Embracing Bewilderment: Responding to Technological Disruption in Heterogeneous Market Environments

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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: heterogeneous markets, misalignment capability, multinational enterprises, strategic contradictions, technological disruption

INTRODUCTION

'Sell your cleverness and buy bewilderment'. – Jalaluddin Rumi (1207–1273)

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

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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 and Krop, 2012; Ansari et al., 2016; Tripsas and Gavetti, 2000; Volberda et al., 2018).

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 behaviour of suppliers (e.g., McIntyre and Srinivasan, 2017; Rietveld and 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).

THEORETICAL MOTIVATIONS

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 behaviour, 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 et al., 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 et al. (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 (Miller, 1993).

Such discussions brings 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.

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 behaviour at MNE headquarters (Andersson and Pahlberg, 1997; Andersson et al., 2007; 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 behaviour, 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.

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 et al., 2017; Alexiou et al., 2018; Haug et al., 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.

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 I we present details of the data sources and how these were used in our analysis.

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

Table I. Data sources

Data sources	*Details*	*Purpose*
Interviews and memos	- 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). - 105 pages of notes from attending management presentation sessions on Cloud strategy.	- 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. - 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.
Internal archives	- Ericsson's managers' comments in an internal online strategy forum from 2009–2014. - 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).	- Acquire a fine-grained understanding of Ericsson's strategy in terms of Cloud technology as it unfolds; understand the strategic concerns of different departments.
Survey	- 138 managers' answers to open questions from 114 Ericsson's accounts worldwide in November and December 2014. - Secondary data collection relating to Ericsson customers worldwide in terms of their regional development, based on OECD categorizations of countries' economic development.	- 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. - Acquire macroeconomic data on customers' regional development.
Published reports, articles, and commentariesW	- Ericsson's annual reports from 2009 to 1016; Ericsson's publicly available histories of key events associated with Cloud technology, including managers' appearances in the media. - 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.	- Gather complementary facts on the strategy and structure of Ericsson as its Cloud strategy unfolds. - 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.

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: (1) long-time engagement with the field to ensure sufficient involvement with the context and data (Lincoln and Guba, 1985); (2) both retrospective and real-time data collection (Eisenhardt and Graebner, 2007) from several different sources of data for triangulation (Eisenhardt, 1989); and (3) 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.

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 analyse 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 analysing 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 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 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.

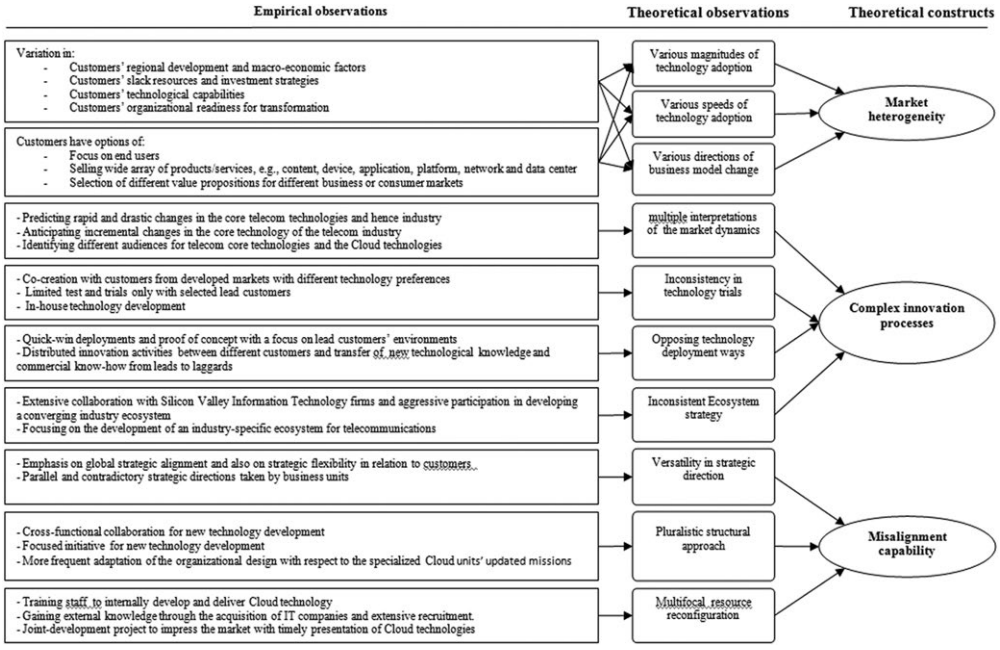

Figure 1. Data structure

RESPONDING TO DISRUPTION IN HETEROGENEOUS MARKETS

Ericsson is a global provider of networking and telecommunications equipment and services, and after divesting its cell phone 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 per cent 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).

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

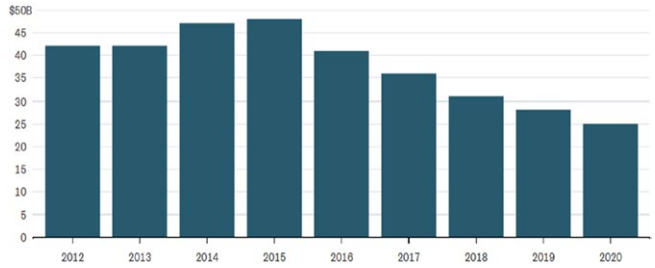

Figure 2. Forecasts for telecommunication infrastructure revenue, 2016–2020
Source: www.bloomberg.com [Colour figure can be viewed at wileyonlinelibrary.com]

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.

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 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.

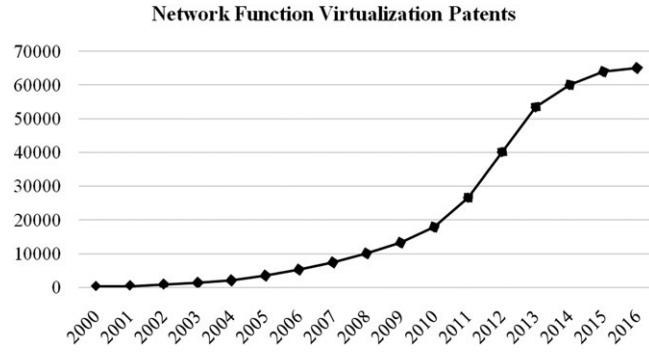

Figure 3. An indication of the growth of Cloud computing technologies

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 fulfil 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 fulfil 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, letalone develop a coordinated roll-out plan.

Market Heterogeneity

As a technology-driven company, Ericsson has been quick to realize the importance of Cloud-based technologies[1] and their implications. The company has a clear ambition to 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 signalled 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 (see survey questionnaire in Appendix) 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 per cent 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 per cent of operators. In addition, operators from less developed and developing regions tend to favour 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 per cent of operators in these regions, while in other parts of the world only 7 per cent 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 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 per cent 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.

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 meetalmost 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 favour 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.

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.

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 favour 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 centres or should establish its own data centres 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?'

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 underrtake 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 favour 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 II 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 behaviour.

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 III 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 favour 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

Table II. Representative quotations reflecting contradictory interpretations of the Cloud

	Dimension	*Example quotations*
Interpretation of the market dynamics	Rapid, large-scale changes	Customers will move ahead with Ericsson or without Ericsson, so we need to act fast.
		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.
		Ericsson should fully align and cloudify and virtualize our product portfolios during the coming years.
		Cloud affects so many things with new business model, with new technology, etc. It affects the whole of the organization, it changes the industry.
		We should quickly expand the scope from being a technology supplier into doing operations, doing different business models, potentially financing and those kind of things, transacting CAPEX into OPEX, those kind of things. [Anything that has to do with the actual technology] to do with the actual technology.
		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.
	Slow-paced, small-scale changes	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.
		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.
		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.
		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.

Table II. *Continued*

	Dimension	*Example quotations*
Experiments and trials	Diverse trials with many customers	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. 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.
	Focused trials, only with key customers	Consistently bring new ideas to AT&T who are looking to leading suppliers to co-invest with them in new domains. 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. 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. 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.
Initial deployments	Redefining the portfolio of offerings	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. 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. 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. 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. 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.

Table II. *Continued*

	Dimension	*Example quotations*
	Close to the existing portfolio of offerings	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. We sensed Cloud as a topic until we [were] looking it in connection with our portfolio and [seeing] how we [could] apply Cloud. 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. 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. We can say that we are cloudified, even if we continue doing what we're doing.
Ecosystem strategy	Disturbing the existing ecosystem	[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. 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. We should create strategic alliances with Silicon Valley key influential companies in the Cloud ecosystem. My competition is … not Huawei. I don't see them in my engagement. My competition is HP, IBM, and the traditional IT equipment suppliers.
	Supporting the existing ecosystem	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. 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. 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. 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.

Table III. Representative inconsistent strategic responses by Ericsson

	Strategic dimension	*Representative incidents and activities*
Strategic direction	Unified	- Articulation of a shared vision, reflected in the strategy plans of all units (2010–2014). - A steering committee reporting to CEO to align Cloud initiatives (2012). - Incorporation of the Cloud in the official product roadmap (2013).
	Versatile	- Emphasizing the 'customer first' approach (2011–14) - Allowing local Cloud projects in different units with different agenda (2011–2014). - 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 (2012–14). - Allowing projects that are not in line with the official product roadmap.
Structure of Cloud initiative	Centralized and coordinated	- Centralizing decision-making for the Cloud in the largest business unit (2011). - Reassigning the decision-making for the Cloud to the largest business unit (2013–14) - Establishing Cloud business unit (2015).
	Decentralized and uncoordinated	- Organizing high-level coordinating and cross-functional teams for Cloud technology (2012) - Establishing small Cloud sub-units in different units (2012–14)
Resources Configuration	Redeployment of existing resources	- Freeze on staff numbers (2013–14). Matching Cloud initiatives to existing employees. - Increasing the number of Cloud-technology-certified engineers to over 300 persons for a single region of 23 countries. - First independent sales summit on Cloud technology (2014). 600 of Ericsson's sales force focused on Cloud.
	Acquisition of new resources	- Laying off employees for three successive years (2012–2014) and recruiting recent graduates to replace them for Cloud-related activities. - Three new R&D centres focused on Cloud computing, with 700 new recruits. - 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).

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:

> '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 favoured 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 favour 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 favoured 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 favour 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. Analysing Ericsson's case, we identified some desirable outcomes as well 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 favour 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.

A MODEL OF FIRM RESPONSE TO TECHNOLOGICAL DISRUPTION IN HETEROGENEOUS 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 favours 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.

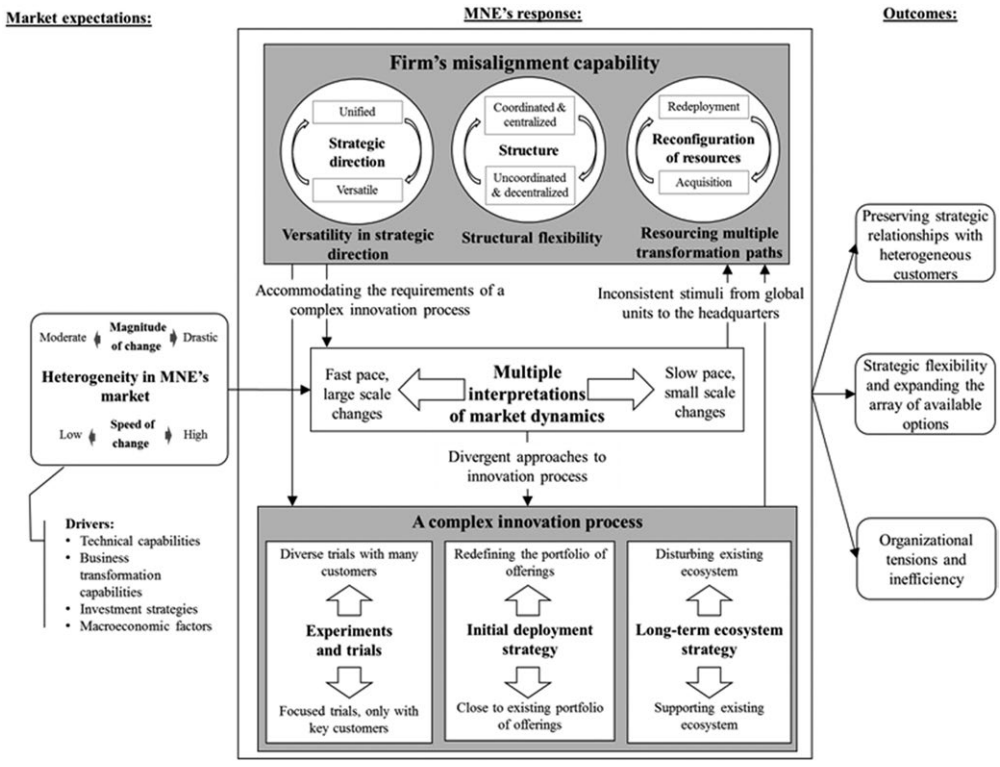

Figure 4. Technology disruption, market heterogeneity, and the implications for MNEs

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. 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 and 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 and 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 et al., 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.

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 et al., 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, 1996); 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.

LIMITATIONS AND FURTHER 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 et al., 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.

NOTE

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

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APPENDIX: SURVEY QUESTIONNAIRE

Cloud technologies adoption speed and magnitude[a]

1- Please rate your customer concerning the following Cloud-related technologies[b]

No activity	*Some speculations*	*Preliminary plans*	*Concrete plans*	*Already in deployment phase*	*I don't know*
1	*2*	*3*	*4*	*5*	

Software Defined Networking (SDN)

Network Function Virtualization (NFV)

OSS/BSS modernizations based on Cloud technologies

Providing public and enterprise Cloud offerings (email, chat, media, etc.)

Purchasing Telco-as-a-Service (TaaS) from a vendor

Purchasing organizational/business consultation services from a vendor

Purchasing technical/operational consultation services from a vendor

How do we need to change?

2- From your perspective, what major improvements Ericsson needs to make in order to fulfil the requirements of your customer in the next 3–5 years? [A text box for survey respondents to write their answers.]

[a]The Cloud technologies categorization is validated by the technology experts.

[b]Coding schema for the speed of adoption 'No activities (1)' and 'Some speculation (2)' = 'Laggards', 'Preliminary plans (3)' = 'In-transition', and 'Concrete plans (4)' and 'Already in deployment phase (5)' = 'Leads'; Coding schema for the scope of adoption: Operators with more than four technology scores of higher than 3.5 = 'Wide (3)', operators with more than three technology scores of 2.5 to 3.5 = 'Moderate (2)', others = 'Narrow (1)'.