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Strategies for business model innovation: How firms reel in migrating value

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A B S T R A C T

This paper brings together firm-level research on business models and industry-level research on value migration to examine patterns of business model innovation. We draw on qualitative data from 14 cases and 68 interviews in the computer and telecommunications industries to demonstrate how business model innovation is sensitive to industry-wide forces of value migration. Based on our analysis we conclude that when value is rapidly migrating across industries and between firms, proactively substituting key elements of the primary business model provides a better fit with the new value landscape than launching secondary business models in parallel. We suggest four underlying mechanisms that link business model innovation, value migration and subsequent outcomes. Unpacking business model innovation allows us to discuss contingencies for the main business model strategies, specifically in terms of limitations to—and opportunities of—changing the primary business model and the practice of parallel business models.

Introduction

Only months after the 'dotcom' bubble burst in 2001 when countless young, promising and innovative technology ventures went bankrupt and the euphoria of the 'new' economy disappeared, the computer and telecommunications industries appeared to be getting back to normal again. But were they? In an article published by the Business Week in 2001, Mr. Jorma Ollila, CEO of Nokia, the world's largest cellphone manufacturer at that time, stressed the need for the emerging *"mobile Internet"* to remain *"under the control of the mobile industry, and not the computer makers"* (Baker, 2001). Less than ten years later, his successor Olli-Pekka Kallasvuo found his firm in a peculiar situation. While still the market leader in cell phones, Nokia's previous largest competitors had all been replaced by new players. These new competitors were a different breed. What used to be Motorola, Ericsson, and Siemens were suddenly Samsung, LG, and RIM (Gartner, 2000, 2010) without any particular track record in the mobile industry. More worrying still, revenue streams started to divert away from Nokia's core business. To sustain their mobile handset business, Nokia was forced to partner with software giant Microsoft and appointed Microsoft executive Stephen Elop as their new CEO. Ultimately, the joint venture between the two firms was dismantled, and the business was completely taken over by Microsoft in 2013, before being written off in 2015 (Forbes, 2015). In only six years, Nokia went from being the market leader in mobile handsets to crashing out of business.

What could have caused such a dramatic result? A critical explanation is that value in the mobile industry started to migrate (Jacobides and MacDuffie, 2013; Slywotzky, 1996), amongst others, to a fast mover from Northern California that had only recently entered the industry with their iPhone product. Apple entered the mobile industry as a complete outsider and

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rocked the industry by fundamentally changing the rules of the game, shifting the focus of attention away from hardware and technology towards software and content. Whereas the old business model was about selling devices, voice minutes and text messages, value started to migrate to an ecosystem of applications and mobile services. The time was ripe for a new business model that could create and capture value.

We analyze these dramatic shifts in the computer and telecommunications industries from a business model perspective (Baden-Fuller and Haefliger, 2013; Björkdahl, 2009; Chesbrough and Rosenbloom, 2002; Demil and Lecocq, 2010; Zott and Amit, 2007, 2008, 2010; Zott et al., 2011). There is a growing consensus that firms need to change, adapt and innovate their business models in order to appropriate value from technological innovation (Baden-Fuller and Haefliger, 2013; Björkdahl, 2009; Hienerth et al., 2011) and to sustain success over time (Chesbrough, 2010; Massa and Tucci, 2013; Teece, 2010). However, scholars are still debating the merits of different business model innovation strategies. One powerful stream of business model research advocates the operation of multiple, parallel, and partly even conflicting business models as a mechanism for hedging risks and opportunities (Casadesus-Masanell and Tarzijan, 2012; Markides and Charitou, 2004; Markides, 2013). An alternative view suggests changing the primary business model to align with shifting demands (Bock and George, 2014; Doz and Kosonen, 2010; Johnson et al., 2008; McGrath, 2010; Sosna et al., 2010).

To shed new light on these opposing business model innovation strategies, we marry the firm-level research on business models with industry-level research on value migration. Value migration is here defined as the shift in value-creating forces that makes value move between firms and their business models (Slywotzky, 1996). Often this happens as value moves from old business models to new business models that better meet customers' concerns and desires. Specifically, we ask: *how can firms pursue business model innovation when value is migrating across industries and between firms?* More broadly, answering this question allows us to start exploring the largely neglected relationship between industry dynamics and business model innovation (see e.g. Abernathy and Utterback, 1978; Utterback, 1994a; Dosi, 1984; Carlsson, 1997 for in-depth discussions on industry forces that enable and constrain firm-level innovation).

We investigate this question through a multiple case study of 14 large and prominent firms in the converging computer and telecommunications industries. We demonstrate that when the industry is characterized by rapid value migration, firms are most successful when they take a proactive stance by substituting key elements of their primary business model in tandem with the external business environment—a practice known as 'pivoting' (e.g., Blank, 2013). Our results are incorporated into a wider contingency framework that allows us to contribute to the debate on the advantages and disadvantages of changing the primary business model or launching secondary business models that run in parallel (e.g., Markides, 2013).

This article is organized as follows. Section Literature review: value migration and business model innovation reviews the literature and sets the theoretical foundation for our study. Section Research design presents the research design and introduces our empirical setting. Section Findings: patterns of business model innovation presents our findings and provides a first categorization of the patterns observed. Section Discussion: explaining business model innovation in dynamic environments discusses explanations for our observations and theorizes on a set of underlying mechanisms. Section Contributions to theory and practice concludes the paper by summarizing our contributions to theory and practice.

Literature review: value migration and business model innovation

In the field of strategy, it is well established that firm-level decision making is influenced by meso- and macro-level phenomena (Brown and Eisenhardt, 1998; also see the industry lifecycle literature, e.g., Abernathy and Utterback, 1978). Indeed, it has been acknowledged that industry-level factors such as technological developments impact business models (e.g., Afuah and Tucci, 2001). Yet, business model research is relatively silent with regard to how the relationship between industry dynamics and business models can be characterized, and how the resulting strategic choices available to firms unfold. In order to develop a perspective of business model innovation that is sensitive to industry-wide phenomena, we draw on the concept of value migration (Jacobides and MacDuffie, 2013; Slywotzky, 1996). If we consider, for example, the list of Fortune 500 firms, it is easily observable that many firms that were top performers 10, 20, or 50 years ago have been replaced by new firms from either the same or new industries. Value has clearly migrated between firms as well as industries. Value migration can be understood as the shifting of value-creating forces that over time determine the profit level of firms (Jacobides and MacDuffie, 2013; Slywotzky, 1996). Value can migrate between industries and often flows between firms within the same industry (especially in industries characterized by intense competition and innovation) but can also flow between different business units or products within a firm (Slywotzky, 1996). Value can migrate from outdated business models to new ones that have a better product-market fit in relation to customers' most important priorities (Slywotzky, 1996). While some firms may achieve value inflow (firms absorb value from other firms) due to changes in their business models, others will experience value outflow (firms lose value to other firms) because of business models that have become less competitive, or even outdated.

The business model literature has successfully developed frameworks and practices to capture the intricate interrelationship between the creation and appropriation of value (Björkdahl, 2007, 2009, 2011; Chesbrough and Rosenbloom, 2002; Osterwalder and Pigneur, 2010; Teece, 2010; Zott et al., 2011; Massa et al., 2017). Most work in the realm of business models has focused on coherence and assumed a static relationship between business model elements (see e.g.,

Demil and Lecocq, 2010, for a discussion). Recent developments, however, emphasize a need for a more dynamic perspective that addresses innovation in the business model itself – in other words, business model innovation (e.g., Björkdahl and Holmén, 2013; Chesbrough, 2010; Sanchez and Ricart, 2010; Zott et al., 2011; Massa et al., 2017). Any fundamental change in the relationship between business model elements can be understood as business model innovation (Björkdahl, 2009). We define the business model as the logic and the activities that create and appropriate economic value as well as the link between value creation and value capture. Value migration only underscores that firms must pursue business model innovation to remain competitive. However, ambiguities still exist regarding under what conditions business model innovation takes place and how it plays out.

From the perspective of established firms, changing an existing business model represents a problem of focus. An influential stream of business model research advocates running multiple, parallel, and partly even conflicting business models as a mechanism for hedging risk when pursuing new opportunities. Drawing on ambidexterity literature, Markides (2013) elaborates on the creation of such separate business models. A historic example of a company that kept two business models physically separated is IBM that entered the personal computer market through a separated and dedicated business model and organizational unit. Utterback (1994b) argued that the task of creating the competencies needed to successfully enter the market hinged on creating an organization with clear mandates and independence from the staff and committees of their parent company. Similarly, Casadesus-Masanell and Tarzijan (2012) argue that firms may need to use distinct business models if they want to outperform competitors, forestall potential disruptors, enter new markets, make more efficient use of resources, or develop new income streams. They argue that running separate business models in tandem is a way to diversify revenues and profits—thereby reducing risk. However, some scholars have pointed to critical challenges. For example, by running parallel business models in separate organizations, the firm may fail to exploit synergies between them (e.g., Day et al., 2001; Markides and Oyon, 2010; Markides, 2013). Running parallel business models is difficult and is often the leading cause for strategic failure (Porter, 1980; Casadesus-Masanell and Tarzijan, 2012). A reason for this is that business models cannot be anticipated in advance and must go through learning and experimentation (McGrath, 2010). As a result, running parallel business models can be dangerous when they are planned in advance rather than learned over time. The practice of running a parallel secondary business model leaves all the elements of the primary business model unchanged. The secondary business model is fundamentally distinct from the primary business model along one or several business model elements, e.g., by providing a completely different customer value proposition through targeting previously untapped customer segments via a new distribution channel. The practice allows for low degrees of integration and "Chinese walls" provide protection against 'contamination' between the primary and secondary business models even though they might share some resources.

An alternative approach is to change the primary business model to be at par with shifting demands (Bock and George, 2014; Johnson et al., 2008; McGrath, 2010; Sosna et al., 2010; Berends et al., 2016). Instead of complementing the primary business model with additional business models kept in parallel and separate 'quarantines,' the firm can transform the elements of the primary business model in tandem with the external business environment. The argument is that business models need to change over time if firms want to sustain their value creation and value capture (Achtenhagen et al., 2013). Doz and Kosonen (2010) emphasize that successful firms run the risk of failure if they stay with what used to be right, without changing their business models in line with the changing business environment. Instead, firms need to shape, adapt, and renew their underlying business model on a continuous basis (Achtenhagen et al., 2013). This is usually conducted by a process involving a shift from cognitive search to experiential search consisting of a lengthy trial and error process in the established business model (Berends et al., 2016). Borrowing from the language of sport, the practice of changing the primary business model is sometimes labeled *pivoting*. Like a basketball player pivots by keeping one leg stationary and moving the other leg around to search for a desirable position, firms pivot to experiment and search for an improved primary business model (for a discussion on pivoting, see e.g., Blank, 2013, p. 65). In other words, firms experiment and "tweak" elements of their existing primary business model in a path-dependent way where pivoting (oftentimes several pivots are required to find a desirable position) results in a new direction and a new primary business model. These changes in a firm's primary business model are corroborated by the dynamic capability perspective which aims to explain the success of a firm over time through its ability to change and adapt to the environment (Teece et al., 1997; Achtenhagen et al., 2013). The dynamic capability perspective suggests that, in order to stay competitive, firms need to adapt and renew their business models by sensing, seizing and transforming (Teece, 2007). Such dynamic capabilities appear to be especially important in volatile environments (Teece et al., 1997; Eisenhardt and Martin, 2000).

Conceptually, business model innovation dovetails value migration: changes in business models might be needed when there are structural changes in industries and when new ecosystems emerge (Johnson and Suskewicz, 2009)—and firms need to reinvent where and how they create and capture value. The remainder of this paper explores how different business model innovation strategies play out in dynamic environments, in particular, when there are strong industry-wide forces of value migration.

Research design

The purpose of this paper is to analyze patterns of value migration and business model innovation. We opted for a multiple case study design that allows us to analyze a variety of events and outcomes, examine patterns on a larger scale, and eliminate

chance association (Eisenhardt, 1989, 1991). We describe data collection and data analysis separately, although they occurred in parallel during the course of the research project.

Research setting: firms exposed to value migration

We selected the computer and telecommunications industries as our empirical setting. These industries have been significantly exposed to value migration, due to massive forces of industry convergence. Industry convergence alters the basis of competition by blurring the boundaries between previously separate industries (Lee et al., 2010; Greenstein and Khanna, 1997). As an implication, value is migrating across industry boundaries, which creates fundamental shifts in how value is being distributed, created, and captured (Lee, 2007). Oftentimes, this results in competition between firms which did not compete with one another initially (Prescott et al., 2014). Well-known examples include e.g., Apple that successfully brought together computing and mobile technologies as well as struggling Nokia, who was exposed to value migrating rapidly away from their business (Alcacer et al., 2011a; Vuori and Huy, 2015). Specifically, the context of our firms included in the sample is given by the value chain of the converging computer and telecommunications industries (see e.g., Cisco, 2016). We describe the context as five generic stages of the value chain, depicted in Fig. 1. Typically, the outputs of one value-adding stage are the inputs of the next one, which means that value accumulates at each stage to make up the total value stream and each of these stages moves progressively closer to the end user (Davies, 2004). The stages are as follows: *Component manufacturers, Infrastructure manufacturers, Device manufacturers, Network carriers,* and *Value-added service providers* (see Fig. 1).

The firms in these five stages face different business model challenges, due to changes in the industry structure driven by value migration (Hacklin et al., 2013). The degree of value migration between firms in the computer and telecom industries was generally lower before the industries began to converge (we label this period Era 1). The period after industry convergence had set off (we label this period Era 2) was instead characterized by increased dynamics in the industry and the migration of value between firms. Specifically, for the firms in our sample, Era 1 represents the period of a largely unchanged business model. Era 2 begins as value starts to migrate due to industry convergence, and the focal firm displayed change in its business model. At the same time, the degree of value migration can vary across different stages of the value chain (see Fig. 1).

Sampling and data collection

Our sampling ensured that each stage of the value chain would correspond to at least two firms. Additionally, we relied on the following selection criteria: (1) the firm's headquarters were at the time of sampling (year 2005) located in the US or Europe, (2) the firm could be regarded a prominent case on the basis of the significant size of the business (annual revenue at least 1 billion USD at the time of sampling), and (3) the research team could gain high-level access (specifically, interviewing current or former members of senior management as well as accessing sufficiently detailed

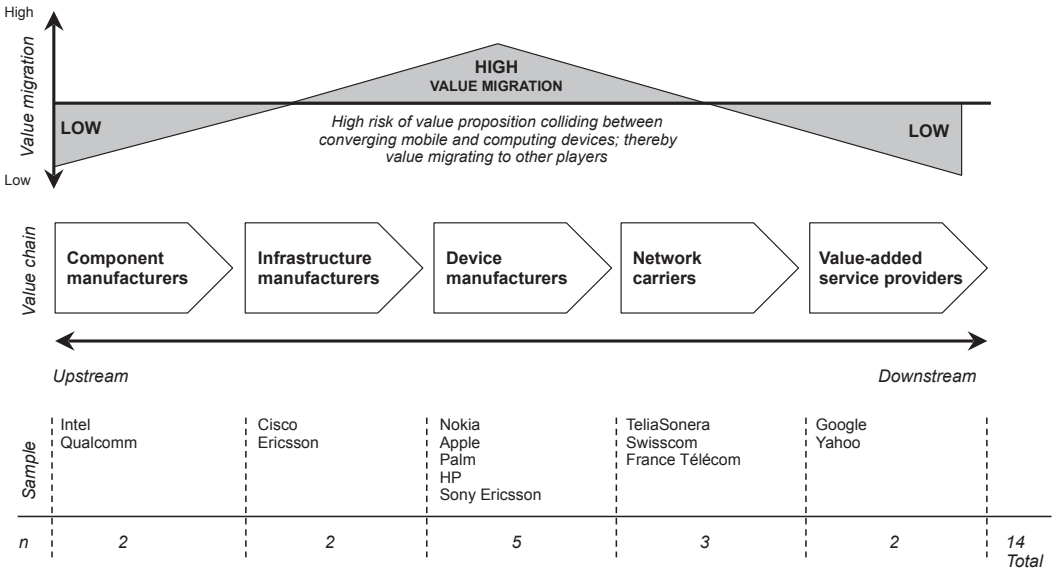

Fig. 1. Research setting represented as firms along different stages of the value chain.

supplementary material). This resulted in a set of 14 prominent firms (for a descriptive overview see Fig. 1 and Table A1 in the Appendix).

Data collection was focused on how firms responded to value migration. Specifically, we collected data in terms of *customer value proposition, distribution channel, customer segment,* and *revenue streams* in Era 1 (business model before value migration) as well as in Era 2 (business model after value migration) in order to capture the firms' business models (see Table A1 in the Appendix).[1,2]

We used interviews as the primary method for collecting data because they provide a rich account of informants' experience and knowledge (Fontana and Frey, 1994; Holstein and Gubrium, 1997). We conducted interviews with senior and middle managers from all firms. In total, we conducted 37 formal interviews and 31 informal conversations. All the interviews were recorded and transcribed verbatim. Interviews were organized along a semi-structured guideline and conducted either in person or over the phone. The interview duration was typically 1 h, and we were able to conduct follow-up conversations (often by email) to fill gaps in the data. Informants were identified and contacted either using the social networking platform LinkedIn or through our personal contacts. Additional informants were identified following a snowballing principle (Biernacki and Waldorf, 1981). In addition to interviews, we collected secondary archival data from firms, e.g., annual reports and presentations pertaining to strategic challenges. Further, for each company, relevant academic articles and teaching case studies were revisited. Moreover, for seven of the firms, the authors had privileged access as a result of prior employment relationships, consulting assignments, or executive education programs. Interaction with case firms was eased by the fact that the authors were based in Silicon Valley and Scandinavia during the observation period—regions at the forefront of the converging telecom and computer industries. This procedure of collecting data from both primary and secondary sources was iterated until saturation was reached and we had sufficient information to describe the case as well as the change in all components of the primary business model for each firm (Miles and Huberman, 1994). For an overview of data collected, see Table 1.

Data analysis

The data analysis followed a four-step approach. First, we wrote up short narratives on how the firms were affected by value migration. Second, for each firm, we described the firm's focal business model during Era 1 and how the business model changed during Era 2. Specifically, we described all business models in terms of customer value proposition, distribution channels, customer segments, and revenue models. To do this, we developed sub-level coding elements that were assigned to the data (see Fig. 2). An initial list of sub-level elements was developed by reviewing the business model literature and was subsequently extended, refined, and condensed as data analysis proceeded. The first round of manual coding was performed by one author and was validated through discussion, modification and refinement involving all three authors. Coding was performed manually, through color-coded annotations in the interview transcripts, as well as aggregation in spreadsheets. Third, we analyzed business model innovation by tracing the changes in business model components between Era 1 and Era 2 (see Table A1 in the Appendix). We then compared each firm's business model innovation with known archetypes in the business model literature (see e.g. Markides and Charitou, 2004). As a result, each business model innovation response was assigned the label 'primary' or 'secondary'. Fourth, we assessed the outcome of each firm's business model innovation by investigating the impact on the firm's ability to create and capture value, as well as changes in its financial performance.

Validity and reliability

In the iterative process of collecting and analyzing our data, various measures were taken to ensure the quality of our findings. Drawing on the suggestions provided by Gibbert and Ruigrok (2010), we followed a set of guidelines to strengthen validity and reliability. First, the main research actions of this study were centered on collection of interview and archival data. Our focal sources of data consisted of our informants, mostly senior managers and executives of each firm, who by virtue of experience and respective roles in their organizations represent knowledgeable experts in the field. To improve objectivity, we complemented our analysis with statements and financial figures from annual reports. Further, through documenting how data was accessed, collected and analyzed, we constantly strived towards establishing a chain of evidence (see also Eisenhardt, 1989). Finally, our research was designed as a multiple case study, situated in a well-defined industry context,

[1] We define the business model as the logic and the activities that create and appropriate economic value as well as the link between value creation and value capture. The business model describes how a firm takes resources, often in the form of technology, as inputs and converts them into economic outputs through customers and markets, thereby connecting resource potential with the realization of economic value (Chesbrough and Rosenbloom, 2002). In so doing, the business model specifies the following six elements: (1) what customer segments are being served, (2) what the customer value proposition is, (3) which activities should be performed in-house and which outsourced, (4) how the firm configures its resources, (5) how the firm sells and distributes its offering and creates value for the customer, and (6) how the firm profits from these activities through its value-capture mechanism (Björkdahl, 2009).

[2] These components correspond to a subset of the framework by Osterwalder and Pigneur (2010), by excluding all components that do not refer to activities of creating and capturing value. Moreover, this selection of components can be regarded as in line with prominent definitions by e.g., Magretta (2002), which in prior works have been claimed to constitute exhaustive representations of a firm's business model.

Table 1
Overview of access to data collected for this study.

Value chain activity	Firm	Primary data				Secondary data
		Formal interviews (n = 37)	Informal conversations (n = 31)	Site visits	Other formal interaction	Archival data c
Component manufacturers	Intel	Director (Santa Clara, 2006); Director/General Manager (phone, 2006); Senior Specialist (phone, 2014)	Director (Boston, 2014)	Yes		Annual reports briefings, trade websites
	Qualcomm	Director (phone, 2006); Senior Specialist (phone, 2014); Senior Director (phone, 2014)		No		Annual reports analyst briefing trade press, we
Infrastructure manufacturers	Cisco	Director (phone, 2006); Vice President/General Manager (phone, 2006); Former Director (phone, 2014)	Director (Zurich, 2012; 2013)	Yes	Workshop	Internal docum annual reports, briefings, trade websites
	Ericsson	Vice President (phone, 2014)	Senior Vice President (Stockholm, 2005); Vice President (London, 2008); Director (Stockholm, 2014)	Yes	Past employment	Internal docum annual reports, briefings, trade websites
Device manufacturers	Nokia	Senior Manager (Mountain View, 2006); Senior Manager (Espoo, 2012); Business Development Manager (Espoo, 2012); Manager (phone, 2014); Director (phone, 2014)	Senior Manager (Helsinki, 2007; 2013); Director (Lausanne, 2011); Former Executive Vice President (Helsinki, 2013)	Yes	Workshop	Internal docum annual reports, briefings, trade websites
	Apple	Manager (Cupertino, 2006); Manager (Cupertino, 2006); Former Senior Manager (Zurich, 2014)	Former Senior Manager (Palo Alto, 2006); Director (San Francisco, 2012)	Yes		Annual reports analyst briefing trade press, we
	Palm	Director (Palo Alto, 2006)	Former Manager (Palo Alto, 2006)	No		Annual reports analyst briefing trade press, we
	HP	Vice President (phone, 2006); Former Vice President (Zurich, 2014)	Former Vice President (Zurich, 2010)	No	Past employment	Annual reports analyst briefing trade press, we
Network carriers	SonyEricsson	Executive Vice President (phone, 2008); Director (phone, 2008); Senior Manager (phone, 2014)	Executive Vice President (Lund, 2007); Executive Vice President (Lund, 2007)	Yes	Consulting	Annual reports analyst briefing trade press, we
	TeliaSonera	Manager (phone, 2014); Senior Manager (phone, 2014)	Senior Manager (Stockholm, 2012); Manager (Stockholm,	Yes	Consulting; executive education	Internal docum annual reports,

Table 1 (*continued*)

Value chain activity	Firm	Primary data				Secondary data
		Formal interviews (n = 37)	Informal conversations (n = 31)	Site visits	Other formal interaction	Archival data c
			2012); Senior Manager (Helsinki, 2013)			briefings, trade websites
	Swisscom	Director (Palo Alto, 2006; 2006); Senior Manager (Zurich, 2014); Manager (phone, 2014); Senior Specialist (Zurich, 2014)	Senior Manager (Zurich, 2011; 2014); Senior Manager (Zurich, 2011); Vice President (Zurich, 2013); Senior Specialist (Zurich, 2014)	Yes	Consulting	Internal docum Annual reports briefings, trade websites
	France Télécom	President (phone, 2006); Manager (phone, 2014); Manager (phone, 2014)		No		Annual reports analyst briefing trade press, we
Value-added service providers	Google	Senior Director (Mountain View, 2012)	Senior Engineer (Zurich, 2008); Senior Director (Mountain View, 2011; 2012; 2013; 2014); Senior Engineer (Zurich, 2012); Former Director (Gothenburg, 2013)	Yes		Annual reports analyst briefing trade press, we
	Yahoo	Director (Sunnyvale, 2006); Former Senior Specialist (phone, 2014)		No		Annual reports analyst briefing trade press, we

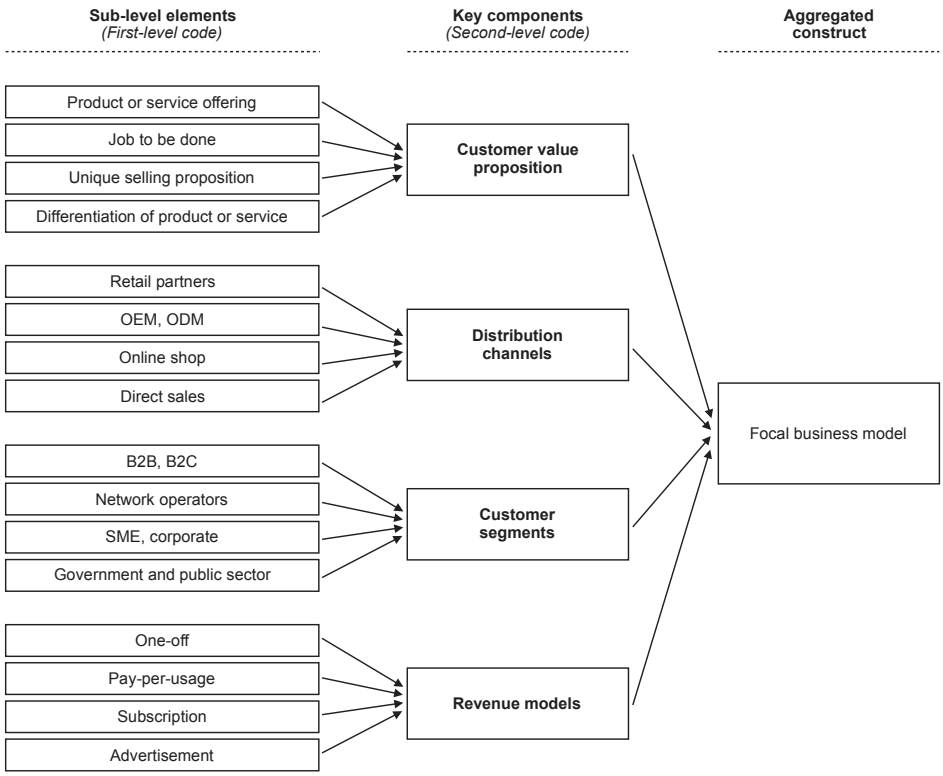

Fig. 2. Coding structure.

which allowed us to achieve necessary control over a complex phenomenon. Putting emphasis on these measures, we believe, contributed to strengthening the validity of our findings (cf. Gibbert and Ruigrok, 2010).

Second, in the process of collecting our data from these focal sources, we applied snowballing techniques. That is, we continued to schedule new or follow-up interviews as well as to collect additional material for our fact base until saturation was reached (see also Section Sampling and data collection). Further, we triangulated our initial findings with additional sources of data, such as company-internal archival data, Internet research, and blogs to ensure our qualitative analysis accurately captured the relationship between the firms' actions and their contingent environment. We maintained a central data repository for our case study research, containing all transcribed interviews, archival documents, discussion notes and intermediate theory development accounts. Finally, we were able to keep our case analysis focusing on non-sensitive company-specific information, which allowed us to have case firms to appear by their own name as opposed to treating them anonymously. By applying these measures, we strove to enhance the reliability of our findings (cf. Gibbert and Ruigrok, 2010). In the following section, the results of the data analysis are presented.

Findings: patterns of business model innovation

How can firms pursue business model innovation when value is migrating across industries and between firms? To answer this question, we analyzed four distinct patterns of business model innovation.

Pattern 1. Secondary business model innovation under lower value migration

A variety of firms in our sample who found themselves in an environment of lower value migration—Yahoo, Intel, Ericsson, TeliaSonera, Swisscom and France Télécom—pursued an approach of launching secondary business models in parallel to the primary business model. While being exposed to new market conditions and a reconfiguration of the industry environment, firms' mechanisms for value creation and value capture were only marginally affected. To capture value, these firms essentially left their primary business model unchanged and set up new business models in parallel. For example, Intel extended their offering toward mobile computing and launched a new unit that focused on developing technologies for future mobile handsets. As one director at Intel reflected,

> "With our new ultramobile PC initiative, we are collaborating with Microsoft to develop mobile handsets, that allow the full PC experience. […] But it is not about the PC, it is about communication: always connected, everywhere, every

> time, where we need multiradio functionalities. But, this is just the tip of the iceberg. [… In the future,] we will look at more radio technologies, but do not exactly know yet which ones." (Interview)

Ericsson, a market leader in mobile base stations, subsystems, and related billing solutions, perceived a risk of value migrating away from the firm's business model unless they managed to widen their scope and gain a significant foothold in the Internet and computing space. In their annual report, the company pointed out:

> "Should we not succeed in understanding the market development or acquire the necessary competence or develop and market products and solutions that are competitive in this changing market, our future results will suffer." (Annual report, 2007, p. 105).

Ericsson responded to these challenges through a number of multimedia acquisitions, keeping their primary business model around the design, manufacturing, and delivery of infrastructure equipment and services more or less unchanged.

Yahoo left their primary business model largely unchanged, but started to offer adjacent software-related services through various isolated initiatives targeting niche segments, such as hosted services for small and mid-sized firms. A similar response was chosen at TeliaSonera. The Scandinavian network operator started to offer adjacent businesses by, for example, experimenting with a new hotspot business to become the dominant supplier of such technology. France Télécom also started to build separate units based on new and local businesses. The network carrier Swisscom left their primary business model more or less intact but launched a number of initiatives to capture some of the value that started to migrate away from their legacy business. Swisscom believed they needed to complement their traditional business model that relied on providing infrastructure access with something else. However, they were undecided about the future direction of the firm. A manager at Swisscom explains:

> "Now, we need to start separating our businesses. [On the one hand,] infrastructure and access, a utility, like power and water, has to simply 'be there'. We call it 'online oxygen,' it is a bread-and-butter business, which belongs to the infrastructure of every country. That is one option, but in the future one thousand people would be enough to run this whole infrastructure for our country, including wholesale. [On the other hand,] the question is, does one want to go one step further and become a provider of services?" (Interview)

To "go one step further," Swisscom set up a corporate venturing unit for strategic investments into promising young technology firms (interview), yet left them fairly isolated with respect to the firm's primary business model.

In all these cases, changes in the primary business model were relatively small to nonexistent and were related to mainly changing revenue models, e.g., pay-per-minute, flat rates, or capped usage. TeliaSonera introduced a unified model for charging the customer across different services, where *"you have a main subscription and then you have a 'data bucket' with an extra 'data sink' for your iPhone or tablet, which actually has changed the way we are billing the customer"* (interview). Swisscom, in turn, launched the 'infinity' pricing system, moving away from charging the customer for minutes or data units, but rather for transmission speed.

All of these firms fared relatively well as they were situated in parts of the value chain were value migration was comparatively lower (see Fig. 1). Intel succeeded in increasing their revenues substantially and at the same time increased their operating margin and return on equity. Ericsson also succeeded in increasing their revenues but saw a large decline in operating margins and return on equity. Among the mobile operators, there were different results. TeliaSonera and Swisscom saw small changes in their revenues, operating margins, and return on equity. Worst off was the network carrier France Télécom and the value-added service provider Yahoo that both saw a decline in revenues and operating margins (see Table 2).

Pattern 2. Primary business model innovation under lower value migration

At the same time, a second group of firms in equally stable environments adopted a different response resulting in both better and worse performance than the first group of firms. This group of firms—Cisco, Google, and Qualcomm—chose to probe, pivot and implement substantial changes to their primary business models. For example, Cisco, a leader in designing, developing, and distributing network equipment for the Internet and computer infrastructure (and a major competitor of Ericsson) realized that it would not be sustainable to solely rely on their leading position in creating technical infrastructure. This was because value was likely to become more volatile in the future with the risk of migrating towards other players in the ecosystem. To meet these new challenges, Cisco decided to revamp their primary business model to support cross-functional activities. A Cisco manager explained:

> "For years, we were in functional silos, and I think we did everything we could to optimize the functions. And we recognized that the next level of productivity and the next level of innovation would come from a cross-functional approach to building an integrated business model." (Interview)

Cisco started to increasingly try out different ways of launching vertical services for specific customer segments, drawing on its technology, but turning it into more specific areas of application. The company also started to reach out directly to consumers, first, launching a network infrastructure-related education offering, and then gradually moving into video-conferencing services. Currently, the company is aiming to become a dominant player in enabling distance education services. Cisco's changes in the business model are quite different from those of Ericsson. While Ericsson has added several new business areas, e.g., through the acquisition and integration of a video-conferencing manufacturer, while keeping their

Table 2
Summary of firms, value migration, business model innovation and financial outcome.

Firm	Value migration	BM innovation	Financial outcome[a]
Intel	*Low*	*Secondary*	Succeeded to substantially increase its revenues during the period (58% increase from 2006 to 2014) and to increase its operating margins. The ROE also increased over the period to 21% in 2014.
Qualcomm	*Low*	*Primary*	Succeeded to have a remarkable growth in revenues (250% increase from 2006 to 2014) with only a slightly decreased operating margins (to 29% in 2014). The ROE was kept around 20%.
Cisco	*Medium*	*Primary*	Revenues decreased slightly with a minor increase in operating margins (8% in 2014). The ROE also decreased over the period.
Ericsson	*Medium*	*Secondary*	Revenues improved over the period (28% increase from 2006 to 2014). However, the operating margin went down heavily (from 20% in 2006 to 7% in 2014). The ROE decreased substantially to 8% in 2014 from over 20% in 2006.
Nokia	*High*	*Secondary*	Revenues decreased substantially from 2006 to 2012 (28%) in a growing market. Operating margin went from 13% in 2006 to −8% in 2012. Nokia sold off its handset division to Microsoft in 2013 in order to get the company on feet.[b]
Apple	*High*	*Primary*	Had a remarkable growth in revenues (850% increase from 2006 to 2014) and a remarkable growth in operating margin (from 3% in 2006 to 29% in 2014). The ROE increased in a remarkable way from 5% in 2006 to 35% in 2014.
Palm	*High*	*Primary*	Saw strong decreases in revenues from 2006, and saw decreases in operating margins and net income. From 2008 Palm was starting to make losses and in July 2010 HP bought Palm for 1,2 billion USD.
HP	*High*	*Secondary*	Had a growth in revenues (22% increase from 2006 to 2014) and saw a small decline in operation profits (down to 6% in 2014). Its ROE increased slightly to 19% in 2014.
SonyEricsson	*High*	*Secondary*	Had remarkable decline in revenues and lost over half its revenues from 2006 to 2011. The company went from net margins of 12% in 2006 to loss making in 2011. In 2012, Ericsson divested its 50% share of the company to Sony following loss of competitive edge in mobiles.[c]
TeliaSonera	*Medium*	*Secondary*	Increased its revenues slightly over the period (11% increase from 2006 to 2014) with sustained operating margin (about 26% in 2014). Its ROE increased slightly over the period.
Swisscom	*Medium*	*Secondary*	Increased its revenues over the period (21% increase from 2006 to 2014) and saw a small decline in its operating margins. Its ROE decreased to 31% in 2014, but from very high levels.
France Télécom	*Medium*	*Secondary*	Saw declined revenues (24% decline from 2006 to 2014) and at the same saw a small decline in operating margin to 12% in 2014. ROE dropped sharply from 15% in 2006 to 4% in 2014.
Google	*Low*	*Primary*	Saw a remarkable growth in revenues (520% increase from 2006 to 2014) with almost sustained operating margins (25% in 2014). The ROE declined to 14% in 2014.
Yahoo	*Low*	*Secondary*	Saw its revenues decline sharply (28% decline from 2006 to 2014). Its operating margins also declined sharply and to as low as 3% in 2014. Its ROE increased to 19% in 2014 from 8% in 2006 mainly because of its sell of Alibaba shares.

[a] Financial outcome for observation period 2006–2014; Source: Companies' annual report; Return on Equity (ROE) is the corporation's success in using the capital shareholders have invested to generate profit. ROE is measured as the net income returned as a percentage of shareholder's equity.
[b] For a better comparison, Nokia's period is from 2006 to 2012, due to sales of handset division to Microsoft in September 2013.
[c] SonyEricsson's period is from 2006 to 2011. SonyEricsson was taken over by Sony in January 2012.

primary business model fairly unchanged, Cisco has gradually and iteratively changed their primary business model toward becoming a full-fledged service company. Instead of suddenly overhauling the primary business model, the process followed more of a trial-and-error logic, that is, probing and rolling back each step if not successful, allowing the firm to *pivot* between different business models. In comparison, Ericsson has complemented their primary business model of manufacturing and distributing infrastructure equipment and added various related service offerings. Cisco, by contrast, transformed their business model so that the manufacturing of network equipment has now become a means to an end, that is, subordinate to delivering telecommunication services such as video conferencing.

Similarly, Qualcomm managed to transform from a semiconductor firm into a company focusing on telecommunications products and services. Gradually, the company evolved their primary business model from developing hardware to integrating hardware and software into new value propositions. In turn, Google, the leading search engine company, sensed great opportunities to extend their service offering, launching a number of new products connected to their platform. Similarly to Cisco, all the initiatives were synchronized and strongly connected with the primary business model—driving traffic to the search engine that supports the advertising revenue model, including the infrastructure and platforms supporting their core business.

Thus far, we have established that firms exposed to minor forces of value migration fared relatively well. Both Qualcomm and Google saw a remarkable growth in revenues (250 and 520 percent from 2006 to 2014, respectively) with sustained margins and outperformed all the firms that responded with an additional and complementary business model run in parallel with the primary business model. An exception is Intel that saw a lower increase in revenue growth compared to the other two firms, but saw a better outcome in operating margin and return on equity. Cisco, a firm that also pivoted their primary business model, on the other hand, did not perform (on average) better than many of the firms that launched a secondary business model that ran in parallel with the primary business model (see Table 2). Hence, the financial outcome shows mixed results compared to the other set of firms, and this set of firms fared from very (Qualcomm and Google) to relatively (Cisco) well. In the following sections, we elaborate how this relationship unfolds in environments of higher value migration.

Pattern 3. Secondary business model innovation under higher value migration

Nokia, SonyEricsson, and HP are cases in point. In the case of HP, value started to migrate from their traditional PC business towards online offers. HP complemented their primary business model of selling computing and printing hardware with an ecosystem for online digital photo printing, free online photo albums, and free photo-sharing services. In the words of a former director at HP:

> "HP had a similar starting point to Apple. However, the main difference in my view is that HP lacked the platform structure and the software competence… HP was not a software company and really sucks at software, so that was one component that was missing." (Interview)

The company responded to the challenge, yet essentially left the existing hardware business model of HP unchanged.

> "We made changes for sure, but I did not see any changes in the principal business model. Instead, we just added new product and business lines. We did not do anything to change the existing value propositions to the customers. Apple changed many things with their principal business model when they went digital; they changed the value proposition, distribution through Appstore, and their revenue streams among other things… HP made a couple of big mistakes and missed a couple of turns." (Interview)

Nokia, a device manufacturer that for a long time dominated the mobile handset industry, was traditionally running a "vertical business model" (former strategy executive at Nokia, archival data). The vertical business model was based on a strong component supply chain and well-established sales of their mobile device products to mobile operators, business, and private customers worldwide. The company's senior executives envisioned value migration towards software and services already in the late 1990s (see also Doz and Kosonen, 2010; Vuori and Huy, 2015). As a result, the company launched "Club Nokia" in 1998 and integrated user-generated content and community collaboration into the service offering. They also launched a first-generation smartphone, a foldable phone with full QWERTY keyboard already back in 1997, allowing more complex software, including various simplified office applications to be installed on it. Yet, at earlier phases of the value migration, these new efforts were kept relatively separate from their hugely successful primary business model, which consisted of the sales of feature phones for the consumer market and which represented the source of all volumes and margins. At the same time, while the new service paradigm slowly emerged with the introduction of a highly successful business smartphone in 2005, and a sensationally popular consumer smartphone in 2007, the company was convinced that the new competing players entering the mobile phone business—Apple or Samsung—would remain marginal. Further, Nokia managers for a long time believed that they had found the winning business model, that is,

> "[our] management believed that it had found the 'recipe for success' [consisting of] global logistics plus a broad range of products," which "prevented it from acknowledging that service was the business—until too late" (former strategy executive at Nokia, archival data).

In response, top management focused all their efforts on the primary business model which was built on economies of scale, where the company's "culture and management systems supported volumes and a large product range" (former strategy executive at Nokia, archival data). Yet, as the value to be captured in that industry migrated more or less entirely away from the hardware devices toward software and 'apps,' Nokia ended up struggling to execute their primary business model profitably. None of the complementing efforts had paid off, particularly as focus was directed away from them back to the primary business model as times got tough.

Similarly to Nokia, although many years earlier, SonyEricsson turned out to be even less successful in fending off value migrating away from the handset market. After some minor attempts to build some businesses to complement their cellular phones, the company ultimately failed to create and capture value from their primary business model.

This set of firms ended up in a situation that became problematic for the firms in terms of their attempt to create and capture value. HP was the only firm that succeeded in increasing their revenues, but at the same time suffered from low operating margin (6 percent in 2014). For Nokia and SonyEricsson, their responses were disastrous in terms of creating and capturing value as shown by their financial outcome (see Table 2). Both firms saw a remarkable decline in revenues and went from prospering firms to loss-making firms with severe problems for their owners.

Pattern 4. Primary business model innovation under higher value migration

Apple, on the other hand, successfully adapted their primary business model to be at par with a rapidly changing business environment. Apple realized that as computing and mobile technologies converged, value would start to migrate toward smarter devices and services. As they were at that time strongly in a device business related to personal computers (the Mac and later the iMac), in response the company started to pivot their primary business model. Initiating a number of such pivots, Apple launched the iPod in an effort to bring music experience through a new form of MP3 players to a wider consumer market on the basis of a simpler and slicker user interface:

> "…if you look at current users, we have to design for a grandma." (Interview)

As this business seemed to take off, the company started experimenting with an online music store allowing music to be purchased directly from the digital device. This, again, was very well accepted by consumers and turned out to be a catalyst for selling the iPod player itself. Very soon, far more revenue was generated by the online music store than by iPod device sales. A couple of years later, the company decided to widen their product portfolio to enter the mobile phone business. Against mainstream analyst and the incumbents' expectations, the company was able to capture a remarkable market share from a handful of established players on the market, as their product offering was different enough from existing smartphones. As one manager reflected,

> "I would like to say that it was pre-emptive visionary thinking, but it wasn't. It was more reacting. It wasn't that we were completely wrong. But it was more that this is the way the market is heading and the consumer market has changed quickly." (Interview)

A few years later, just after the prominent global launch of the iPhone, the company pulled off the same trick as with their iPod players: introducing another online store to try out a new way of getting consumers to access content and buy software for their smartphone devices. This online software store initially followed a closed model, that is, only allowing applications developed by Apple to be sold. After several months of consumer complaints, the company decided to open up their online software store, allowing anyone to develop, promote, and earn money with software using the company's store. This model turned out to be exceptionally successful and within a short time catapulted the sales of the smartphone device into a leading position on the market. Again, the true cash cow was the combination of an online software store with the smartphone device, not the device itself. Yet, as the company's services are strongly integrated across all the devices in their portfolio, the company has found a winning model to lock the consumer into Apple's device family which, in turn, allows the company to sustain higher margins on the devices. Hence, in less than a decade, the company introduced a variety of different new device families in combination with online store concepts—some of them more successful right away, others requiring tweaking here and there. As one manager described this experimentation culture:

> "There is a famous quote from one of our executives that says, 'Perfection has very poor ROI'. I mean it's now everything, […] a pragmatic aspect. We have very short [development] cycles. If you look historically we are maybe 18 months on average and that seems obscene. I mean you can't get a lot of stuff done during that time. There is a pragmatic aspect as far as solving the 80 or 90 percent case and making sure [it works]. […] if you look at design, details around tweaking value, across the enterprise there is a profession in that as far as they admit." (Interview)

What sets Apple apart from many other firms is how they managed to consistently adapt and amend their primary business model so that various business model elements supported each other. The business model can be described as relatively simple: belonging to the Apple ecosystem creates value for customers through access to and sharing of content, simplicity of use etc. Apple then appropriates large portions of that value through premium-priced hardware and by controlling the distribution of content (e.g., music and apps) (see also, e.g., Thomke and Feinberg, 2009). For example, Apple was instrumental in creating a market for wireless speakers through their Airplay standard. A former Apple engineer told us:

> "Apple (and Cisco) licensed the technology [Airplay] for free to anyone who wanted to implement it […] and that was creating a new market." (Interview)

In short, Apple's repeated changes to their primary business model resulted in a novel one where all parts of the business are interrelated through their software and online store. In so doing, the company has an integrated business model with the purpose of integrating the same customer segment into new products and services rather than building completely separated businesses focusing on entirely new customer segments. Apple's measures resulted in value starting to migrate towards the company, which also is reflected in its remarkable growth path (see Table 2).

Others were not as proactive. A case in point is Palm that only reacted to migrating value at a very late stage when their business model had already been unsuccessful for a while. As a result, Palm was more or less forced to change the very essence

of their business, as the underlying cross-fertilization of technologies rendered their core value proposition increasingly obsolete. Palm operated a business model based on portable handsets, at that time so-called personal digital assistants (PDAs), aimed at assisting their users with personal information management (PIM) such as calendars and contacts. Previously, PIM data was synchronized with a desktop PC through a cable or docking station. The business model consisted of selling the device and related software as a standalone product. The increasing pressure from communication technologies forced Palm to think about integrating communication features into their handsets, either through entering the emerging smartphone market or through finding other ways to complement their knowledge base with the emerging requirements. However, instead of turning their devices into full-fledged communication and PIM tools, a platform-oriented model was created, opening up for third-party vendors to build on the emerging smartphone and software ecosystem. The transformation from traditional handset equipment vending into the building of an ecosystem was based on the premise of achieving a mediating role between devices, telecommunications, and the emerging ecosystems.

> "The challenges then were how do we create and leverage models so that rivals feel that 'we're in line with them,' we add value to what they're doing, we're not just about 'what business are you working on, thank you very much, and I can add it to my pipeline.'" (Interview)

Hence, Palm was no longer a sole supplier of PDA devices to someone who would have combined these with communication facilities and related software applications but instead embraced the competition from both worlds, i.e., mobile handsets and application software, to build a model based on bridging them. Along with this transition, Palm gradually gave up on their own software operating system, PalmOS, and started shipping devices running operating systems by mainstream providers, with the promise of getting access to the software ecosystem and communication facilities they offered. This transition was, apparently, perceived as a major loss of the company's prior usability advantage, despite new technologies such as web browsers, email, or an integrated phone.

> "When we had reviews of this device, people said, 'Well, it's pretty good, it's almost as good as a [your old device]!' We're competing against ourselves." (Interview)

Following this, the company tried to go back to their original model, shipping devices with an updated version of their proprietary operating system. In parallel, the company started to develop an open source-based operating system, which would open up to content from the Linux ecosystem. While initially gaining much respect from their peers, the platform was compromised through technical flaws and hardware problems. At this point in time, the advantage gained by other players in the smartphone arena was already becoming massive. As a result, Palm lost their power and advantage based on their original customer value proposition (e.g., their intuitive user interface) as synchronization with computers had become a commodity. In this new situation, Palm's value proposition was destroyed and value migrated to other players. Piece by piece, Palm lost market share and eventually went out of business.

For an overview of the patterns identified, see Fig. 3. Table 2 shows a summary of firms, their value migration context, their choice of business model innovation, as well as the high-level changes in firm performance.

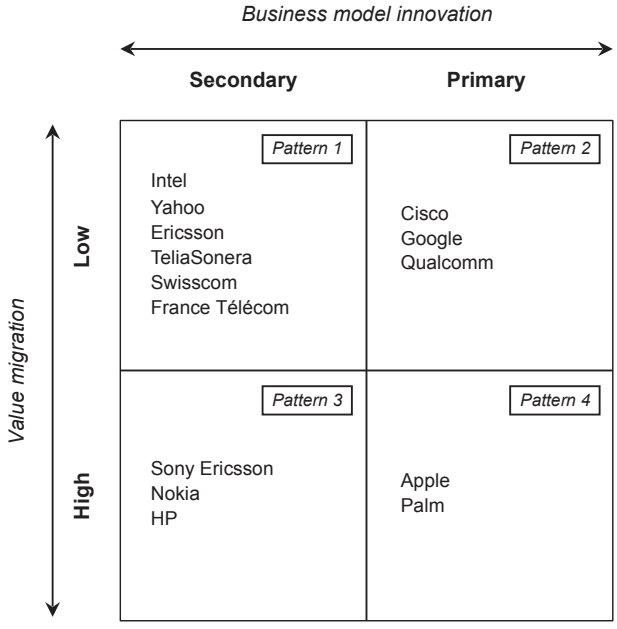

Fig. 3. Case firms' selected type of business model innovation versus value migration.

Discussion: explaining business model innovation in dynamic environments

This paper has brought together firm-level research on business models and industry-level research on value migration to examine patterns of business model innovation. Our main goal was to investigate how business model innovation plays out in dynamic environments where value is migrating rapidly between firms. Three main observations can be made. First, under great degrees of value migration, pivoting the primary business model improves value creation and value capture at a greater rate than launching new secondary business models that run in parallel to the primary one. Second, proactively pivoting the primary business model is more likely to generate adequate value creation and value capture than reactive changes to the primary business model. Third, under lesser degrees of value migration, launching secondary business models may very well sustain or even improve value creation and value capture. Beyond these patterns and observations, in the following section, we will advance a broader theory of the mechanisms that produce these results (for an overview, see Table 3). Unpacking these mechanisms allows us to discuss contingencies for the main strategies outlined in the literature on business model innovation—especially in terms of limitations to the practice of parallel business models.

Firm-market matching is a mechanism that operates as a link between the focal firm's internal environment (in the form of resources and capabilities) and the external environment (in the form of market characteristics and demand conditions). A firm can rely on primary and secondary business model innovation in its pursuit to finding a better match between capabilities and changing environmental conditions. For example, a firm may very well set up parallel business organizations with separate sales organizations to take advantage of new technologies that the main business model and sales organization fail to cater for (as Ericsson did). In contrast, pivoting the primary business model allows the firm to integrate and embed new value-creating activities with the primary business model (as Cisco did). Pivoting the primary business model also allows firms to undergo iterative cycles of learning and experimentation to properly match firm capabilities with market needs, thereby lowering the risk of strategic failure in both the short and long term (Casadesus-Masanell and Tarzijan, 2012). The higher the degree of value migration, the more important it is to succeed with firm-market

Table 3
Examples for mechanisms.

Mechanism	Example
Firm-market matching	Cisco pursued an approach of pivoting its primary business model, allowing the firm to iteratively learn, embed, and integrate new value-creating activities related to video-conferencing software and services to match needs of a growing global market. Ericsson followed an approach of establishing a secondary business model, seeking to improve more short-term market fit through taking advantage of new technologies that the main business model and sales organization failed to cater for. By opening up a new unit focusing on mobile computing devices, Intel followed an approach of setting up secondary business models. Running different business models in parallel allowed Intel to match new market needs by venturing into activities that were rather distant from its primary business model.
Resource re-deployment	Following first successes of its online music store being well received on the market, Apple pivoted its primary business model, which allowed it to deploy further resources to boosting software development. This strengthened its hardware experiences through offering a seamless platform for content distribution. Nokia followed an approach of innovating in a secondary business model and largely continued with business as usual for its primary business model. This caused the detached business model with its tied and inherited resources to over time lose their fit with the external environment.
Attention steering	Cisco and Google, who both changed their primary business models, allowed the top management to direct its attention to the new business model initiatives (video conferencing and device ecosystem, respectively), which in turn helped securing resources. Nokia and Sony Ericsson, who both established secondary business models, experienced difficulties in internally making the case for further investing into their secondary business models (mobile operating system and mobile handsets, respectively), until it was too late ("burning platform", Nokia press release)
Complexity de-escalation	By adhering to a pivoting approach, Qualcomm implemented the integrated platform business model through sequentially substituting parts of its primary business model, thereby keeping complexity of managing the change lower than if it had opted for parallel business models. Ericsson invested into several separated, secondary business models, mostly through acquisitions. While this initially offered a fast way to expand into new activities, the cost of coordinating and integrating these into the primary business model grew out of hand, leading the firm to disinvest several of these ventures.

matching. The reason for this is that the firm's primary business model is under threat when value starts to slip away. However, in environments with lower degrees of value migration, where the firm's primary business model is not under threat, secondary business models that run in parallel is an effective way to explore new market opportunities with minimal changes to the firm's asset base. In fact, in such an environment, changing the primary business model may very well be a riskier choice because of potential switching costs and resource inefficiencies. Needless to say, changing the primary business model constrains the firm's ability to diversify into new business models. In the quest for growth, business model diversification may be a way to spread the value creation and value capture activities and grow the firm in a new direction. If the firm undertakes the parallel approach, it may give rise to more freedom in terms of business model diversification. Similarly, pivoting the primary business model constrains the firm's search for and implementation of distant business models. Put differently, pivoting the primary business model is riskier the more distant search the firm pursues. Launching secondary business models in parallel, though, increases the likelihood of finding performance peaks distant from the firm's primary business model, but without jeopardizing the primary business model. For example, Intel opened up a new unit focusing on mobile computing devices. As the firm's environment was relatively stable, running parallel secondary business models turned out to be fruitful as this allowed the company to venture into activities that were rather distant from its primary business model. The search for distant business models is also more likely to build new knowledge and capabilities (Laamanen and Wallin, 2009). In environments characterized by relatively low value migration and where the primary business model is not threatened, parallel business models thus provide ample room to experiment with both related and unrelated business model diversification.

Resource redeployment refers to a mechanism explaining the differential outcomes of business model responses. In particular, resource redeployment underscores the advantage of pivoting the primary business model when value has the potential to rapidly migrate away from the firm. When value is migrating, the firm's ability to create and capture value is immediately threatened (Slywotzky, 1996). Hence, the chances are greater that inherited resources will become obsolete. Under such circumstances, the firm needs to be agile in redeploying substantial resources (Penrose, 1959). Launching secondary business models in parallel then holds less promise as it only provides marginal changes to the primary business model. As a result, inherited resources tied to the primary business model—which have the greatest effect on performance—risk becoming outdated. The different outcomes for Nokia and Apple form a case in point. Whereas Apple deployed resources on complementing software with their hardware to build a seamless platform for content distribution, Nokia largely continued with business as usual for their primary business model, which caused the business model and the inherited resources to lose their fit with the external environment over time. Pivoting the primary business model, though, allows the firm to rapidly deploy or redeploy critical resources to where they are most urgently needed. When value migrates at a high pace, substantial changes in the primary business model—not isolated experimentation—is required. In environments of lower value migration, however, where the need for resource redeployment may not seem evident at first sight, firms may fare equally well through resorting to a parallel secondary business model.

Attention steering is a mechanism that, similar to resource redeployment, underscores the advantage of pivoting the primary business model in environments characterized by high degrees of value migration. Both approaches to business model innovation allow the firm to redeploy resources. However, if the firm keeps new business models structurally separate, the units are factually decoupled from the 'parent' company's rules, resources, and social relationships. Although structural separation may initially seem feasible (e.g., Birkinshaw and Gibson, 2004) it steers decision-maker attention (e.g., Ocasio, 1997) away from potentially rewarding solutions. This is because managerial attention is generally directed to larger problems first—in other words, the primary business model—although an embryonic solution may reside in a parallel secondary business model and remain undetected. Put differently, as managers' decisions are a result of limited cognitive capacity (March and Simon, 1958), those business models run in parallel are easier to kill: they are overshadowed by the need to save the firm's primary business model, which may seem to address a more burning issue at that moment, regardless of the promise of the secondary business model. Again, Nokia is a prime example as top management continued to frame their business in terms of number of sold devices, although the market had shifted towards competing ecosystems. The gravity of this situation is underscored in business environments where managerial attention needs to be quickly steered toward finding firm-wide solutions to value migration. Pivoting the primary business model forces the entire organization to pursue an updated business model and, thus, managerial attention is more naturally steered to where pressing problems reside (Chandler, 1962).

Complexity de-escalation is another mechanism that leads to the differential outcomes. Its opposite, i.e., the escalation of complexity is the mechanism whereby the firm over time commits to an increasing number of different businesses, markets, and organizational forms. Although not harmful at the outset, when complexity starts to escalate and grow rapidly, it leads to worsened organizational performance due to coordination costs (Chandler, 1962, 1992; Penrose, 1959). In other words, while running a secondary business model has few detrimental effects when kept at bay, the downside grows as it allows for several parallel attempts, whereas pivoting does not. Too many parallel attempts to change the business model increase organizational complexity and makes it difficult to draw on shared resources that do not necessarily provide a fit with the complete set of business models. For example, Ericsson entered the multimedia industry (mostly by means of acquiring other firms), which had only a loose connection to their primary business model. In particular, complexity risks to escalate, accelerate, and grow when the chosen business model response does not allow for the necessary depth of learning. Even when firms are not running several business models in parallel but experiment with different complements one after the other (i.e., the purest form of parallel business models), there is a risk of escalating organizational complexity. There are two reasons for such

escalation: First, any deviation from the primary business model increases complexity and coordination costs. Second, multiple attempts at parallel business models leave traces that over time risk accumulating into a set of unrelated organizational memories. In contrast, pivoting the primary business model avoids complexity growing out of hand. Shifting the entire firm toward a new business model, the organization experiences fewer obstacles in the form of coordination costs and conflicting organizational memories, and can instead dedicate its resources to the search for synergies and complementarities.

Contributions to theory and practice

The identified patterns of business model innovation provide a number of implications for theory and practice. First, we identify four underlying mechanisms (firm-market matching, resource redeployment, attention steering and complexity de-escalation) that explain the outcome of business model innovation strategies. Prior literature provides only limited evidence on how business model innovation and heterogeneity affect firm performance (Aversa et al., 2015). We provide initial explanations on why pivoting the primary business model is superior to launching secondary parallel business models when value is migrating rapidly. For example, pivoting the primary business model improves the product-market fit because it allocates managerial attention and critical resources more effectively (than running parallel business models) and without escalating organizational complexity. Our results are in line with the literature on dynamic capabilities (Eisenhardt and Martin, 2000; Teece et al., 1997; Teece, 2007). Specifically, the underlying mechanisms provide the firm with the "asset orchestration" capability necessary to manage deep uncertainty in dynamic environments (Teece and Leih, 2016). Similarly, our work underscores the need for sensing, seizing and transforming capabilities as suggested by the dynamic capability literature.

Second, we contribute by providing a 'situated account' of business model innovation in terms of how the external environment affects the firm's business model. While prior research has investigated how business model innovation may improve profitability, market share, and competitive position (Björkdahl, 2009; Sosna et al., 2010), we demonstrate how industry-level forces in terms of value migration (Jacobides and MacDuffie, 2013; Slywotzky, 1996) affect the outcome of business model strategies. For example, we corroborate how the urgency of changing the firm's primary business model is dependent upon the firm's position in the value chain. In other words, firms in the same industry may experience very different exposure to value migration and, thus, urgency for change. Analyzing the computer and telecommunications industries, we show that while firms upstream and downstream experienced comparatively low degrees of value migration combined with new strategic opportunities, firms positioned in the middle of the value chain experienced remarkably higher value migration forcing them to innovate their business models. Yet, firms are not completely at the peril of technology but influence their fate by pursuing different business model innovation strategies. All in all, our paper takes the first steps towards connecting firm-level business model research with industry-level research on technical change (cf. Abernathy and Utterback, 1978; Utterback, 1994a; Dosi, 1984; Carlsson, 1997; Jacobides and MacDuffie, 2013; Slywotzky, 1996; see e.g. Christensen et al., 2005 for a similar apporach exposing the open innovation concept to industrial dynamics).

Third, our findings contribute to the issue of parallel business models. A powerful stream of research advocates the operation of multiple, parallel, and partly even conflicting business models as a way to hedge risks and opportunities (Casadesus-Masanell and Tarzijan, 2012; Markides and Charitou, 2004; Markides, 2013). Our analysis of the computer and telecommunications industries provides supporting evidence for parallel business models in environments characterized by lower degrees of value migration. In such environments, secondary business models offer a low-risk strategy to expand the scope of the firm, without disturbing a well-functioning primary business model. When there is no urgent need for rapid firm-market matching, pivoting may instead expose the firm to unnecessary risk. However, in environments where value is rapidly migrating away from the firm, the primary business model is already threatened. The greatest risk is then to shield the primary business model. In environments of high value migration, creating parallel business models can create an illusion of control when, in fact, the firm is only postponing an urgent decision to change its primary business model. Under such conditions, pivoting—sequentially substituting the firm's primary business model—is more likely to save the company, or even allow it to prosper. However, in environments of lower value migration the need for fundamental change is less pressing and experimentation through secondary business models that run in parallel to the primary business model may be a viable strategy, and may even become advantageous as firms can pursue more distant search without risking the primary business model.

Fourth, our work also provides a number of implications for practice. As managers decide on and implement business model innovation, our work offers actionable insight into the opportunities and threats associated with dynamic environments. When value is migrating rapidly across industries and between firms – due to e.g., industry convergence or digital disruption – managers must quickly assess whether the firm's business model is threatened or not. For such situations, the findings of this study provide the basis for simple, yet effective decision-making heuristics. Should the firm's primary business model be seriously threatened, managers are advised to proactively search for and implement an updated business model that provides a better fit with the new value landscape. Postponing a major overhaul of the primary business model or attempting to implement new business models that run in parallel will not suffice. However, when value is migrating at a slower rate – and most likely not immediately threatening the effectiveness of the firm's business model – managers have more discretion over how to act. In such situations, both business model innovation strategies may provide opportunities for growth, but launching parallel business models is generally a less risky strategy than meddling with a well-functioning

primary business model. Thus, our work identifies a critical managerial challenge: the need to balance the risks and rewards associated with primary and secondary business models. Finally, managers are advised to assess the opportunities associated with value migration. Correctly timed and managed, a changing environment can become a treasure trove of opportunities.

Our work is not without limitations. While we developed a parsimonious model, where business model innovation strategies and patterns of value migration explain value creation and value capture, we acknowledge that other factors may influence these relationships. For example, the literature on industrial organization and innovation (e.g., Tirole, 1988; Teece, 1986; Porter, 1981; Scherer and Ross, 1990 explains e.g., how market power, substitution and complementarities affect the ability of firms to profit. It may very well be that a firm with superior market power or a long history as a supplier of critical components is less exposed to the perils of value migration in the industry. Our work is also limited in terms of idiosyncrasies between the empirical setting and the generalizability of results. For example, some industries are characterized by strong path-dependency and firms may then be constrained in their abilities to pursue business model innovation. Future research could therefore examine value migration and business model responses in other empirical settings. Another limitation is that we cannot fully rule out that the only relationship to financial outcome is the effectiveness of the business model. Even if we define the business model as the link between how firms create and capture value, there might be other explanations for the changes in financial outcome that are dependent on external contingencies outside the role of the firm's business model. On the other hand, given that we have studied firms in the same industry, this risk should be limited. Another limitation of our work is the lack of direct observation of customers' reactions to business model innovation. Future work should strive for collecting data from customers to avoid such bias. Finally, we have assumed that firms rely on their own competences for business model innovation. A fruitful avenue for future research would be to explore how firms draw on external partners to pursue open business model innovation (Chesbrough, 2013). Potentially, there are open business model configurations that equally well can protect firms from the perils of rapid value migration.

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APPENDIX

Table A1
Detailed account of business model innovation.

Firm		Era 1 business model	Era 2 business model	BM innovation	Selected quotes
Intel	*Summary*	Design and manufacture of chipsets for the computing industry	Extending offering towards mobile computing. Launching new unit focusing on developing technologies for mobile handsets and experimenting with new device prototypes.	*Secondary*	"It's not all about merging all these radio technologies, but rather about how to get them onto a platform that additionally is open for new innovations coming down the pipeline. We need an architecture, a platform, that is not stuck and needs innovation." (interview) "We are now in the third incarnation of the firm. Intel 1.0 was the DRAM company. Intel 2.0 was the microprocessor company. Now, here we are, Intel 3.0, the platform company." (interview) "Now, the convergence from Intel's perspective has really been about embracing this opportunity as telco services, data services, communications, and IT convergence; we see a tremendous business opportunity." (interview)

Table A1 (*continued*)

Firm		Era 1 business model	Era 2 business model	BM innovation	Selected quotes
	Customer value proposition	Provisioning of cost-effective processing and related semiconductor chipset equipment for manufacturers of computing systems (PC and servers)	Provisioning of cost-effective processing and related semiconductor chipset equipment for manufacturers of computing systems (PC and servers) as well as for emerging mobile computing domain (e.g., smartphones); offering software and services based on integrated platform combining multiple convergence-related technologies		
	Distribution channels *Customer segments*	OEMs, ODMs, retail PC device manufacturers, buyers of PC components	OEMs, ODMs, retail, online PC and mobile handset device manufacturers, buyers of PC components, tablets, smartphones, automobiles, automated factory systems, medical devices		
	Revenue model	One-off sales	One-off sales, service/ maintenance income		
Qualcomm	*Summary*	Design and manufacture of chipsets for the mobile phone industry	Continuing design and manufacture of chipsets for the mobile phone industry, yet experimenting with means of involving third-party developers through open platform. Gradually moving from sole hardware provider to combined hardware and software provider.	*Primary*	"[We] have this technology called [MEDIATEC], that's a mobile broadcast service, we're now doing everything else than building phones … but also build a lot of equipment from the broadcast layers … acquired the licenses for spectrum … and set up a new company, called [MEDIATEC]." (interview) The company introduced "an open applications platform for CDMA-based wireless devices. Designed to provide solutions for the wireless industry as it moves toward wireless-Internet convergence, the […] platform enables software developers to more easily create and monetize feature-rich applications for CDMA devices and provides users with the opportunity to download applications 'over the air' and personalize their wireless devices to suit their needs." (archival data) The company introduced an "advanced mobile microprocessor delivering [significantly higher] processing speed and unmatched power efficiency. [This product] is the first microprocessor specifically designed and optimized for integration into [the company's existing] solutions, and enables the convergence of mobile handsets with consumer electronics features." (archival data) The company introduced a "platform […] and offers an unprecedented combination of

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Table A1 (*continued*)

Firm		Era 1 business model	Era 2 business model	BM innovation	Selected quotes
					mobile data processing, multimedia performance, 3G wireless connectivity, and the lowest levels of power consumption for all-day battery life. The […] platform delivers an instant-on and always-connected user experience, opening up a new era of innovative computing and consumer wireless mobile devices." (archival data)
	Customer value proposition	Provisioning of modular, cost-effective processing capability together with related semiconductor components for manufacturers of mobile phones	Provisioning of modular, cost-effective processing capability together with related semiconductor components for manufacturers of mobile handsets and consumer electronics; offering integrated platform combining multiple convergence-related technologies		
	Distribution channels	OEM	OEM, partnering with major developer of smartphone software		
	Customer segments	Mobile phone manufacturers	Mobile handset and consumer electronics manufacturers		
	Revenue model	One-off sales	One-off sales		
Cisco	*Summary*	Pioneering the Internet through enabling the underlying network and transport technologies	Building on its strong infrastructure install base, the company started to increasingly try out different ways of launching vertical services for specific customer segments. First, network infrastructure-related education, then video conferencing services. Currently, the company is aiming to become a dominant player in enabling distance education services.	*Primary*	"For years, we were in the functional silos, and I think that we did everything we could to optimize the functions. And we recognize that the next level of productivity, and the next level of innovation, is coming from a cross-functional approach." (interview) "We are also seeking to capitalize on this market transition through the development of other cloud-based product and service offerings through which we intend to enable customers to develop and deploy their own cloud-based IT solutions, including software-as-a-service (SaaS) and other-as-a-service (XaaS) solutions." "Other market transitions on which we are focusing particular attention include those related to the increased role of video, collaboration, and networked mobility technologies. The key market transitions relative to the convergence of video, collaboration, and networked mobility technologies, which we believe will drive productivity and growth in network loads, appear to be evolving even more quickly and more significantly than we had previously anticipated. […] TelePresence systems are one example of product offerings

Table A1 (*continued*)

Firm		Era 1 business model	Era 2 business model	BM innovation	Selected quotes
					that have incorporated video, collaboration, and networked mobility technologies, as customers evolve their communications and business models. We are focused on simplifying and expanding the creation, distribution, and use of end-to-end video solutions for businesses and consumers." (AR 2011) "We will always be a networking company. I think that we are saying that network is the platform, and what happened in voice is becoming an offering all for that platform. […] One of these next verticals on that platform will be video." (interview) "We're also, though, looking to make it increasingly relevant, so there are more and more vertical initiatives at [our company]. And those vertical initiatives, I think that, it's very hard to go from a box selling sales force, to a solution selling one." (interview)
	Customer value proposition	Powering the Internet through infrastructure technology, based on designing, developing, manufacturing, and distributing network equipment	Solving network infrastructure tasks through integrated software, service and product platforms; offering telepresence and distance learning solutions and ecosystem; providing IT-related education services		
	Distribution channels	Direct sales, retail	Direct sales, retail		
	Customer segments	B2B	B2C, B2B		
	Revenue model	One-off sales	One-off sales, fees for education service		
Ericsson	*Summary*	Manufacturing and delivering of application and services, components for fixed broadband access, components for core networks and components for mobile broadband access.	Manufacturing and delivering networks, global services, and multimedia. The components and services were much the same although the company had gone more into multimedia. This was done mainly through the acquisition of firms. The established business model was the same.	*Secondary*	"Industry convergence between telecom, data, and media represents opportunities but also risks. We are affected by market conditions within the telecommunications industry. We are also affected by the convergence of the telecom, data, and media industries, which is largely driven by technological development related to IP-based communications. This change impacts our addressable market, competition, and our objective setting and strategies, as well as the need to consider risks to achieve our set objectives. Should we not succeed in understanding the market development or acquire the necessary competence or develop and market products and solutions that are competitive in this changing market, our future results will suffer." (Annual report 2007, p.105.)

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Table A1 (*continued*)

Firm		Era 1 business model	Era 2 business model	BM innovation	Selected quotes
	Customer value proposition	To deliver application and services, components for fixed broadband access, components for core networks, and components for mobile broadband access.	To deliver application and services, components for fixed broadband access, components for core networks, components for mobile broadband access, and solutions for multimedia services.		
	Distribution channels	Mainly direct sales	Mainly direct sales		
	Customer segments	Mainly network operators	Mainly network operators		
	Revenue model	One-off sales, per usage	One-off sales, per usage		
Nokia	*Summary*	Design, develop, manufacture, and distribution of mobile phones for consumer and business segment (plus network); strong own supply chain and manufacturing for large-scale model	The company rested on its laurels of being a dominant mobile phone player and tried different approaches to integrate mobile internet and enterprise solutions into their offering. Particularly, a business-oriented series was launched to compete against emerging smartphone offerings and incentivizing small firms to co-develop with this unit. After little success with various silo-initiatives against emerging smartphone competition, the company ultimately started collaboration with a major software operating system provider, abandoning its own software and ecosystem efforts, and choosing to focus on devices.	*Secondary*	"The emergence of ecosystems in and around the mobile device market for smartphones represents the broad convergence of the mobile communication, computing, consumer electronics, and Internet industries. Different industry participants, such as hardware manufacturers, software providers, developers, publishers, entertainment providers, advertisers, and ecommerce specialists, are forming increasingly large communities of mutually beneficial partnerships in order to bring their offerings to the market. At the heart of the major smartphone ecosystems is the operating system and the development platform upon which smartphones are based and services built." (Annual report 2011) "Those types of decisions are made from a strategic standpoint, for overall [our company], and about the direction they want to take the company, so you know, the corporate board, then it is looking at each and every one of those business groups, works out a strategy for each and every one of those business groups, and then it is looking at what we have in our IP portfolio, within the business groups, and across Nokia, where are the gaps, and how do we fill those gaps, do we make, partner, or buy, then, depending on how critical it is to have that, either own it internally or not, we'll then determine how you go about partnering or acquiring or just building it on your own." (interview) "Even if considering current solutions, number of subscribers, RIM, or other vendors that enable mobile email on the phone, [the ongoing changes represent a] potential revenue opportunity for [our company] and other providers. Not only from a consumer standpoint, but also

Table A1 (*continued*)

Firm		Era 1 business model	Era 2 business model	BM innovation	Selected quotes
					from an enterprise standpoint." (interview) "A great opportunity for [our company] is: our business is consumer-focused, we can draw from the consumer pool and address the trend of email going mobile. From the enterprise side, we will go out to large enterprises, a large untapped market." (interview)
	Customer value proposition	"Connecting people", based on high-quality handset devices, supported by design, ease of use, and user-friendly platform.	Develop the best hardware experience for smartphone customers in the Windows phone ecosystem with strong partnership with Microsoft		
	Distribution channels	Mainly through retailers and mobile operators	Mainly through retailers and mobile operators, plus flagship stores		
	Customer segments	Business customers and consumers	Business customers and consumers, B2B		
	Revenue model	High margins on devices, based on scale advantages	High margins on devices, based on scale advantages		
Apple	*Summary*	Design (and manufacture) of computers with integrated operating system for sale to home-users, creative professionals, and universities.	The company first started to bring music experience through MP3 players and a music store. Later it integrated and started to leverage mobile telephones and mobile applications. The company also started to design and sell media tablets. All with seamless integration where the services can be used through most hardware platforms. The purpose is that the products and services should be highly complementary. Hence, the diversification into new areas was highly related where each area was highly integrated into the existing business model where the software and common platforms became the denominator.	*Primary*	"The other thing that I was blind about for a bit, because I come from a different world, is that if you look at current users, we have to design for a grandma – can she figure this out? The analogy flaw that was pointed out to me, if you look at kind of the evolution of the proliferation of computers, you know kids in these days, […] how they learn everything. A great analogy was made to me in terms of, you know I am technical [by background], I was formerly trained in this area; [I was told] 'You are still technically a second, you are an immigrant basically, you speak the language because you have learned it, but it is not native to you. Whereas your kids, basically with no formal training, they were born into this generation, they are the first generation of true native computer users.' […] The next generation will raise the bar significantly in [our company]." (interview) "I would like to say that it was pre-emptive visionary thinking, but it wasn't. It was more reacting. It wasn't that we were completely wrong. But it was more that this is the way the market is heading and the consumer market has changed quickly. But it was a tide turn. Something changes and I need to change, and I have not much resistance internally." (interview)
	Customer value proposition	Enabling private and office work by user-friendly computing	Enabling "digital lifestyle" by user-friendly multi-device ecosystem, based on		

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Table A1 (*continued*)

Firm		Era 1 business model	Era 2 business model	BM innovation	Selected quotes
		system, based on integration of hardware and software, thereby differentiating from the competition	integration of hardware and software, thereby differentiating from the competition; mobile devices, and new forms of devices, strong integration between products, unique buying experience, education, and on-the-spot service in stores		
	Distribution channels	Specialized retailers	Specialized retailers, online content store for software and services		
	Customer segments	Consumers, creative industry, education sector	Consumers, creative industry, education sector, mobile users, mainstream consumers		
	Revenue model	High margins on integrated PC configurations and accessories	Repetitive sales, high margins on integrated devices, margins on usage of products through applications and service sales		
Palm	*Summary*	Design of PDA hardware and software with computer synchronization ability	Quit in-house PDA development and started to build smartphones, in particular, through cooperation with another major provider of Internet-enabled smartphones and mobile operators. In this transition, the company tried several approaches to sourcing versus developing the software development and finally abandoned proprietary software. At the same time, literally closing down its international business and moving from an international to a national provider.	*Primary*	"It's a freakin' Frankenstein! It can do a lot of things, but nothing really good." (interview) "I don't think the […] platform is viable long term in the face of its competition." (analyst comment) "The challenges then are how do we create and leverage models so that rivals feel that 'we're in line with them,' we add value to what they're doing, we're not just about 'what business are you working on, thank you very much, and I can add it to my pipeline'." (interview) "When we had reviews of this device, people said, 'well, it's pretty good, it's almost as good as a [your old device]!'. We're competing against ourselves." (interview)
	Customer value proposition	Solve personal diary organization by offering unique user-friendly experience within integrated personal information management (PIM) device	Solve personal diary organization by offering smartphone based on integration into third-party vendor's OS		
	Distribution channels	Retailers	Through operators, i.e., with national/regional operators		
	Customer segments	International business and consumer users	National business and consumer users		
	Revenue model	Sales of devices with integrated software	Sales of devices		
HP	*Summary*	Leading provider of accessory hardware for the personal and professional computing world (mainly inkjet and laser printers) but also strongly positioned on personal computers and server systems.	Experimented to respond to convergence through increasing collaboration across different business lines. Particularly, experimenting with digital photo online service on the basis of the acquisition of a related startup company.	*Secondary*	"People are going to print images taken from camera phones, easy enough, and then we have a big ecosystem model, where we sell printers, and then people buy ink cartridges, and laser toners etc., and that, you know, makes us money. So it's a razor blade model, in many senses." (interview) "Parallel process is the way [our

Table A1 (*continued*)

Firm		Era 1 business model	Era 2 business model	BM innovation	Selected quotes
					company] is doing it. OK, I'm gonna in some sense parallel process, I'm going to be very willing to look outside and acquire and partner with other companies." (interview)
	Customer value proposition	Supporting office and private work through providing computer hardware products (printers, scanners, digital cameras, calculators, PDAs, servers, workstation computers, and computers for home and small business use), with related technologies and solutions	Supporting office and private work through providing computer hardware products (printers, scanners, digital cameras, calculators, PDAs, servers, workstation computers, and computers for home and small business use), with related technologies, solutions, software, and services		
	Distribution channels	Direct sales, OEM, retail	Direct sales, OEM, retail, partners in the ecosystem		
	Customer segments	Consumers, small- and medium-sized businesses (SMBs), and large enterprises, including customers in the government, health, and education sectors	Consumers, small- and medium-sized businesses (SMBs) and large enterprises, including customers in the government, health, and education sectors		
	Revenue model	One-off sales of devices; razorblade model for printers and cartridges; service and lease model	One-off sales of devices; razorblade model for printers and cartridges; service and lease model		
SonyEricsson	*Summary*	Developing, manufacturing, and selling mobile phones, PC-cards, and Machine-to-Machine solutions.	Developing, manufacturing, and selling mobile phones, PC-cards, and Machine-to-Machine solutions. Launched separate smartphone line. No changes in the main business model.	*Secondary*	
	Customer value proposition	Offering connectivity and experience through bringing innovative mobile phone products to market	Offering connectivity and experience through bringing innovative mobile phone products to market		
	Distribution channels	Retailers	Retailers		
	Customer segments	The company aims to reach mainly high-end users. This means that the company has chosen not to focus on budget phones. Both professional and consumers	The company aims to reach mainly high-end users. This means that the company has chosen not to focus on budget phones. Both professional and consumers		
	Revenue model	One-off sales of devices	One-off sales of devices		
TeliaSonera	*Summary*	The company delivers fixed and mobile telephony and broadband and cable TV infrastructure. Most of the services are marketed to the same customer segment.	The company delivers fixed and mobile telephony and broadband and cable TV infrastructure. Based on the services, the company also delivers more third-party content on demand. The different business areas are kept separated using the same business model.	*Secondary*	"Our value chain can be increasingly substituted by those of Internet players. We need to look at different competitors now." (approximate comment at management workshop)
	Customer value proposition	Provisioning of connectivity and data volume for fixed and mobile telephony, broadband Internet, cable TV infrastructure, related services	Provisioning of connectivity and data volume for fixed and mobile telephony, broadband Internet, cable TV infrastructure, related services, content (e.g., movie rental), mobile broadband, payment services		

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Table A1 (*continued*)

Firm		Era 1 business model	Era 2 business model	BM innovation	Selected quotes
	Distribution channels	Own stores, retailers, online	Own stores, retailers, online		
	Customer segments	Consumer and corporate customers	Consumer and corporate customers		
	Revenue model	Pay per usage	Pay per usage, flat rate, pay for additional services		
Swisscom	*Summary*	A traditional national provider of telephony and other telecom services, resulting from national post and telegraph, thereby enjoying favorable market dominance	Meeting convergence through no major change in existing business model, but rather through launching various initiatives to offer new technologies to customer, thereby positively influencing main service perception. Some of the launched initiatives cannibalized existing business.	*Secondary*	"We need to test and play around, look at new services, work much more closely together with the customer, and jointly develop things." (interview) "It is now about solutions and user experience, offering to the customer what he really wants. The customer is not dependent of us anymore, he can easily switch. [Therefore,] we need to offer a platform, where the customer gets the feeling that he can do what he wants. You become an enabler, not anymore a dictator, who alone decides what the customer gets. You enable him to have a better experience. Then—convergence is not an issue anymore, but rather a starting point." (interview) "Now, we need to start separating our businesses. [On the one hand,] infrastructure and access, a utility, like power and water, has to simply 'be there.' We call it 'online oxygen,' it is a bread and butter business, which belongs to the infrastructure of every country. That is one option, but in the future one thousand people would be enough to run this whole infrastructure for our country, including wholesale. [On the other hand,], the question is, does one want to go one step further and become a provider of services. That is a totally new business, where we then also need to offer what the customer wants in the future. […] There we will meet totally new competitors, such as Google, Yahoo, cable operators, Disney, Hollywood, etc. […] Here it will all be about user experience, […] and the customer will not be dependent anymore and can more easily switch." (interview)
	Customer value proposition	"Offer services", including fixed, mobile telephony, broadband Internet, cable TV infrastructure, related services	"Enable services", including fixed, mobile telephony, broadband Internet, cable TV infrastructure, rental of equipment, hotel hotspots, Europe-wide hotspots, related services		
	Distribution channels	Own stores, retailers, online	Own stores, retailers, online		
	Customer segments	Consumer, corporate	Consumer, corporate		
	Revenue model	Pay per usage	Pay per usage, flat rate, pay for additional services		
France Télécom	*Summary*	A multinational telecommunications	Focused efforts on mobile communications subsidiary	*Secondary*	"[For our company] as an incumbent, due to

Table A1 (*continued*)

Firm		Era 1 business model	Era 2 business model	BM innovation	Selected quotes
		corporation, emanating out of a traditional national telephony carrier	in combination with related international acquisitions. Developing innovative pricing services, at the same time starting various, yet uncoordinated initiatives to deliver Internet content.		deregulation, it is per definition given that an incumbent loses market share—the question rather is, how much of the 100% are we loosing, and how much of new services models can an incumbent operator pioneer." (interview) "Operators need to go more downstream in the value chain, because the Internet players will move more upstream." (interview)
	Customer value proposition	Provisioning of connectivity and data volume based on fixed, mobile telephony, broadband Internet, related services	Provisioning of connectivity and data volume based on fixed, mobile telephony, broadband Internet, IPTV, related services		
	Distribution channels	Own stores, retailers, online	Own stores, retailers, online		
	Customer segments	National consumer and corporate	International consumer and corporate		
	Revenue model	Pay per usage	Pay per usage, flat rate, pay for additional services		
Google	*Summary*	Launched a web search engine based on an innovative algorithm and achieved a sustainable business through a simple advertising revenue model.	Building on the successful advertising model, the firm started to continuously launch new service offerings, which oftentimes were prototypes only, and left to the customer base for acceptance and usage tests. Some of these led to new services and entire business units, whereas others were closed down. All initiatives were synchronized with the main business model, driving traffic to the search engine—and thereby the advertisement revenue model.	*Primary*	"The conclusion is that there will be a big shift in advertising spend to this new medium. So what you are seeing is industries in general looking at different ways of spending money that they hadn't done before because this new medium existed." (interview) "So if you look at different industries, let's take travel, everybody wants [our company] to do a travel site, we haven't done one, we don't have time to do one, but the reason why we could do one is because the more inventory we get, for instance, where people can buy keywords to put on a web site the more, […] that means more and more people will start searching on [our website] on travel, so the travel advertising will start spending more and more money on [our website] to advertise to them. So that's why it is important to look at different verticals, you know, if there is a way we can get more money." (interview)
	Customer value proposition	Organize web content through free, intuitive, precise, intelligent search engine, offering best web search experience, and related free web-based services/application (e.g., webmail, maps and photo sharing)	Provide access to free Internet content through a variety of computing devices and cloud-based services, offering seamless integration across them		
	Distribution channels	Direct, online information service	Direct, online information service, online store, retailers		
	Customer segments	Mass market using desktop computers	Mass market using a variety of different computing devices		
	Revenue model	Advertisements through search engine	Advertisements through search engine through		

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Table A1 (*continued*)

Firm		Era 1 business model	Era 2 business model	BM innovation	Selected quotes
			driving traffic and devices sales		
Yahoo	*Summary*	Launched a web search engine based on smart categorization and pioneered the era of online portals	Started to offer adjacent software-related services with various isolated initiatives targeting niche segments (e.g., hosted services for SME firms). Yet, none of these services gained traction and were partly discarded from the portfolio. Main business model remained largely unchanged.	*Secondary*	"If you can become the platform behind it, you have a lot more reach, and over time, you build a really, really strong base of other businesses and other service providers providing additional value." (interview)
	Customer value proposition	Offering generic online applications based on comprehensive consumer web services, including web portal, search engine, email, news, advertising, and related applications	Offering access to business applications based on comprehensive hosted suite and web services, including web portal, search engine, email, news, vertical applications and advertising		
	Distribution channels	Direct, online information service	Direct, online information service, including and incentivizing third-party development (particularly for mobile solutions) through open platform		
	Customer segments	Mass market using desktop computers	SME firms, mass market using desktop computers		
	Revenue model	Advertisements through search engine, "banners"	Advertisements through search engine, "banners"		

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