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Strategic management of business model transformation: lessons from Nokia

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Abstract

Purpose – This paper aims to offer a conceptualization of how and why corporate level strategic change may build on historical differentiation at business unit level.

Design/methodology/approach – Methodologically, an historical case study of Nokia Corporation's drastic business model transformation between the years 1987 and 1995 is reported.

Findings – The conceptual and historical work results in a process model of business model change, demonstrating how central business units feed strategic alternatives and capabilities to the corporate-level transformation process.

Practical implications – The results highlight the importance of corporate level "market mechanisms" that allow promising strategic alternatives to emerge and select out inferior options. In this process, a key mechanism is the exchange of executives and cognitive mindsets between business units and corporate headquarters (CHQ).

Originality/value – The reported research offers an original contribution by showing the dynamic interplay of cognitive and organizational change processes, and highlighting the importance of building on existing capabilities and competencies despite the pressure to demonstrate strong turnaround activities.

Keywords Business planning, Organizational change, Business history, Telecommunications, Corporate strategy

Paper type Research paper



Incumbent firms often face situations in which their historically evolved business model loses its relative advantage in the pressure of market dynamics. After recognizing the threats in competitive erosion, firms typically engage in transformation processes that aim to revitalize or turn around the firm's business model. Then, the difference between success and failure of transformative activities boils down to the firm's ability to change its business model effectively and in rhythm with the dynamics of the external business environment (Burgelman, 1994; Siggelkow, 2001). But the interesting question both in theoretical and practical terms is: From

where does the new business model emerge? Academic literature on corporate venturing and intra-organizational ecology (e.g. Burgelman, 1991, 1994, 2002), as well as turnaround management (see, e.g. Lohrke *et al.*, 2004), offer some answers to this question – yet not exactly from the perspective of business model change but rather from the perspective of changes in strategic and organizational routines. Thus, there is a lack of studies that would focus on business model change and its origins, and on the evolutionary competition preceding radical business model changes.

In this paper, hence, we focus on the transformation of the business model (e.g. Tikkanen *et al.*, 2005) of an incumbent corporation. Especially, we are interested in demonstrating the strategic importance of managerial and organizational cognitions (Walsh, 1995) in business model evolution. While many researchers have concentrated on conceptualizing various generic components of the business model concept (Morris *et al.*, 2005; Siggelkow, 2001; Amit and Zott, 2001), managers' conceptualizations of business models and their links to business model evolution have mostly escaped from researchers' attention so far. Consequently, we focus on the following broad research question: How do the cognitions of the executives of a particular corporation and its business model co-evolve?

We address the identified research gaps by offering a conceptualization of how and why a business unit's business model is dynamically interlinked with corporate level change. Moreover, we investigate the issue to what extent a radical business model transformation is manageable. As an outcome, we offer a process model of business model evolution, demonstrating how central business units feed strategic alternatives and capabilities to the corporate-level transformation process. Our model also highlights the importance of corporate level "market mechanisms" that allow promising strategic alternatives to emerge and select out inferior options. A key mechanism in our model is the exchange of executives and ideas between business units and corporate headquarters (CHQ), especially the top management team (TMT).

Business model: a conceptual model

Managers regularly use the term business model to describe the logic of a firm, the way it does business and how it creates value for its stakeholders. Academic research (for a review, see, e.g. Tikkanen *et al.*, 2005), in turn, has referred to business models particularly when dealing with the formation of novel (systemic) mechanisms and architectures through which business will be done *vis-à-vis* the greater business environment and industry networks (Zott and Amitt, 2008; Chesbrough and Rosenbloom, 2002). Figure 1 illustrates our research framework on managerial cognition and business model evolution.

The framework essentially builds on the earlier work of Tikkanen *et al.* (2005) in conceptualizing a business model as a combination of firm-related material structures and processes that exist objectively "in the world", on the one hand – and intangible, cognitive meaning structures that exist in the minds of people at different levels of the organization, on the other (Tripsas and Gavetti, 2000; Kaplan *et al.*, 2003). Other elements of our present framework include the managerial decisions and consequent competitive actions, constituting the main mechanism between the evolution of the firm and its environment. The environment contains the market process and business performance, which recursively affect the evolution of the business model. In the following, we explicate our conceptualization, resulting in three specific research questions.

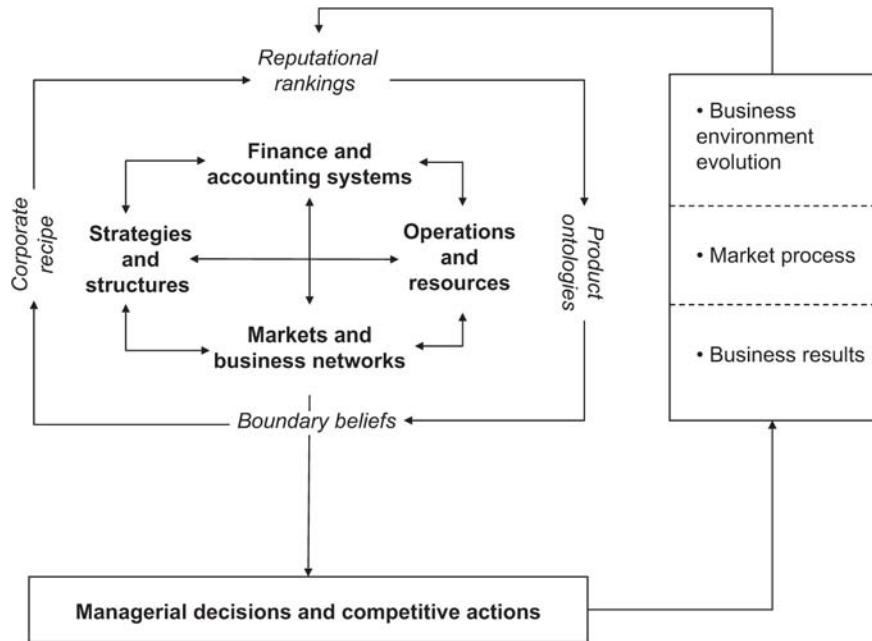


Figure 1.
Research framework

Material aspects

By the material aspects of a business model, we refer to the tangible elements of (formal) strategies and structure (Hambrick and Fredrickson, 2001; Porter, 1996); markets and business networks (Achrol and Kotler, 1999; Anderson *et al.*, 1994); operations and resources (Bartlett and Ghoshal, 1995; Barney, 1991; Nelson and Winter, 1982); and finance and accounting system (Kaplan and Norton, 1992). The categorization is practically valid since most elements often appearing in managerial discussions on business models fall under these headings in a convenient way (e.g. strategic intent falls under “strategy and structure”, customer relationships under “markets and business networks”, and products/offers under “operations and resources”). With regard to a multi-business unit corporation, the material aspects of a business model can in principle be examined either at the level of an individual business unit, at the level of the corporation, or at both levels (Burgelman, 1994; Burgelman, 2002; Volderba *et al.*, 2001). Due to our interest to understand the evolution of a multi-unit firm, we focus our attention to both levels.

Cognitive aspects

By the cognitive aspects of a business model, we refer to the systemic belief systems held by managers of the corporation at various levels, about the (present or future material aspects) of the business model. Both the cognitions of corporate executives and the (middle) managers of a corporation’s various (business) units and functional departments matter (Walsh, 1995). The belief system is seen as the eventual driver of firm decision making and, subsequently, action (Barr *et al.*, 1992; Tripsas and Gavetti, 2000). Essentially, our perspective to managerial cognition follows Porac *et al.*’s (2002)

four-level belief hierarchy. Porac *et al.*'s (2002) framework identifies four conceptual levels of managerial cognition related to the material aspects of the business model of the firm:

- (1) industry recipe;
- (2) reputational rankings;
- (3) boundary beliefs; and
- (4) product ontologies.

Industry recipes are beliefs related to the logic of the economic, competitive, and institutional environment, and their effects on the focal firm (Spender, 1990). As such, the concept applies best to a corporation's or business unit's perceived relationships to its external – and often also internal – environment. For instance, the belief of the synergistic relatedness of the business units to each other (Stimpert and Duhaime, 1997) is a part of the industry/corporate recipe as well as the perceived legitimacy of sustaining a certain set of multiple units or a certain level of diversification (Benner, 2007; Berger and Ofek, 1995; Comment and Jarrell, 1995; Lang *et al.*, 1994; LeBaron and Speidell, 1987; Porter, 1987; Zuckerman, 2000).

Boundary beliefs refer to social constructions that identify a focal firm with a certain inter-organizational community. Also this concept, as such, applies best to a corporation's or business unit's perceived relationships to the external environment. However, we also apply this concept to the internal environment of a corporation by considering the social constructions that identify a corporation and its TMT with a certain subgroup of business units. For instance, a perception of shared resources (e.g. raw materials, technologies) or customers may act as a basis for identifying more than one of a corporation's units in the same business area. Strategic tools, such as product market matrices, are often used to cluster corporate business units into various categories (e.g. "stars", "question marks", "cash cows", "dogs" in the classic BCG matrix; see Ghemawat, 2002).

Product ontologies, in turn, are cognitive representations that link, for instance, product or service attributes, usage conditions, and buyer characteristics into a definition of an offering that is hoped to become superior on the target market. Besides relative to the external environment, the definition of this concept is also directly applicable with regard to the internal market environment of a corporation, across units.

Finally, reputational rankings refer to how organizations evaluate competitors' business models and performance *vis-à-vis* their own. For instance, the mentioned product-market matrices are often used to internally rank the corporation's business units in terms of performance and, for example, growth prospects (Baden-Fuller *et al.*, 2000).

Business model evolution

An evolutionary perspective to business models means that the material and cognitive elements are intertwined in processes that result in changes both in corporate business model(s) and in the surrounding environment. This perspective allows both managerial agency/adaptation and higher-level systemic emergence to affect business model evolution. According to co-evolutionary logic, one must pay attention to the fact that the process itself has its own power over the mere rational choices of the manager-actors (Volberda *et al.*, 2001; Lewin and Volberda, 1999; Djelic

and Ainamo, 1999). On the one hand, manager-induced corporate decisions and actions are contingent both on the existing business model and on the managerial cognitions, which can be seen as the filter between the tangible current/existing (vs. new/alternative) elements of the business model and the decision-making process (White, 2001). On the other hand, both the material elements and the managerial cognitions are contingent on the changing outcomes of managerial action as well as on changes in the business environment.

As illustrated in Figure 1, the process of co-evolution between managerial cognition, action, and the business model of a multi-business unit corporation build on the following logic. Managers view and make decisions regarding the material aspects based on their cognitions that can be located at the four conceptual levels of beliefs identified above. Consequently, the mechanism underpinning the actualization of any relevant business related outcomes consists of how the material aspects of the business model interact with managerial belief systems. The outcomes may be basic business performance outcomes such as sales, market share, and profits of the corporation and its units, or growth or decline in these. In addition, the outcomes may also be changes in the business environment of the corporation such as the reshaping of markets or society in general due to innovative offerings or accumulation of market power, or alteration of regulation due to successful lobbying.

The pictured mechanism by and large constitutes the evolution of the corporate business model of a multi-unit firm. While all the material elements and cognitive elements are more or less interdependent, it should be noted that the material strategy and structure elements most essentially link to the corporate recipe level in the managerial belief system. Moreover, the market and business network elements link to most closely to boundary beliefs; operations and resource base elements to product ontologies; and, finally, finance and accounting elements to reputational rankings among competing units of the corporation.

In what follows, we present a study of business model evolution of a venerable multi-unit corporation, Nokia Corporation, by adopting this co-evolutionary research perspective. In the context of our study of Nokia's business model transformation, relevant analytical levels consist of simultaneous and interlinked processes at the levels of:

- surrounding business environment (signaling a need for changes);
- corporate level business model; and
- business models of particular (business) units, multiple in number.

Building on the above discussion, it is warranted to ask the following three specific research questions:

RQ1. How do business models evolve at the corporate and business unit levels?

RQ2. How do management teams cognitively construct the relationship between the tangible elements of the business model and the business performance of a firm?

RQ3. What are the mechanisms that allow transformation in business model evolution?

Method

As there exists limited prior understanding on business model transformations as a function of top management cognition and multi-level co-evolution between business units and corporate headquarters, we engaged in explorative historical case analysis. The strength of our approach is that it allows the use of predetermined concepts from the business model and cognitive literatures and perspectives, yet enabling us to simultaneously build inductive theoretical propositions. The inductive theoretical work essentially builds links between the conceptual constructs from which we started our historical inquiry. In contrast to mainstream case studies that rely on contemporary materials and interviews, our historical approach helps us to focus on the entire longitudinal process from corporate prosperity to crisis in economic performance, and finally to the transformed and profitable firm. Also, we avoid most of the problems typical in case studies. Especially, our rich historical data helps to deal with potentially biased retrospective interviews, and insufficient document information, which potentially spoil qualitative case studies.

We choose to study Nokia Corporation as an illustrative example of a corporation whose business model has dramatically transformed in the face of changing environmental dynamics. Especially, Nokia's radical divestment of most of its traditional business areas at the beginning of the 1990s and the firm's subsequent refocus on a few telecommunications businesses demands special attention from a business model point-of-view. The most notable changes occurred in the period of our interest (1985-1995), when the corporation's market focus expanded from the original focus on paper, rubber, and cable industries to the field of consumer electronics – which was eventually replaced by a focus on mobile telecommunications: mobile telephones and mobile telecommunication networks (Häikiö, 2001a; Kuisma, 1996). Moreover, the changes in the corporate action patterns were just as dramatic. For instance, periods of organic growth alternated with spells of frantic M&A activity. Also, the corporate culture changed from a slow-moving conglomerate to a strategically agile and focused telecommunications market leader (Kosonen and Doz, 2008). Among the various business units of Nokia, we decided to focus on mobile phones and telecommunications, as our initial research revealed that it was the most distant unit relative to corporate level activities in 1987; yet its business model and culture practically surpassed all other alternatives by 1995. Overall, Nokia case lacks straightforward generalizability but it offers conceptual representativeness to the extent that it can be seen as a legitimate research setting to study business model transformation in theoretical terms.

Our data collection proceeded in two phases. First, we engaged in historical analysis of Nokia and its market environment in order to identify with Nokia's evolution, as embedded in context. As a part of a larger research program, we started our inquiry by collecting over 50 academic publications that focused on Nokia's history. This collection was read in order to create a timeline of main historical events in Nokia's development, and to obtain an understanding of how other researchers have treated Nokia's business model elements. At the same time, we collected newspaper articles, business magazine reports, and other public material that we triangulated with the academic research reports. After this initial phase of data collection, we pulled together all available public material produced by Nokia. This material included full series of annual reports, CEO letters, and company internal magazines.

After having a solid collection of publicly available material, we entered in the second phase of our data collection. We obtained access to the Nokia archives, and received a permission to use all available Nokia documentation until the year 1995. This archival material included, for example, board meeting protocols and memos, correspondence between corporate head quarters and business units, circular letters, strategic planning documents, market analyses, and other archive material from the corporate archives. What is more, we also collected systematic material from three business unit level archives (namely cables, telecommunication, and paper and pulp) resulting in a set of representative and comparable material relative to what had been gathered at the corporate level. To complement our archival data, we also conducted 14 interviews among former Nokia executives and other experts from the telecommunication industry. Our informants included five former members of the executive board, four executive and vice-president level managers from corporate headquarters, and five middle-manager level individuals who had worked in important positions during the transformation. The interviews were semi-structured, with a duration ranging from 60 to 180 minutes.

We started our analysis phase by, first, writing a synthesis of Nokia's history in conjunction with the larger societal and market development. At the same time, we built a chronological database of Nokia's historical development focusing especially on key strategic decisions, changes in the top management team, and changes in the corporate structure. Second, after the initial phase of historical analysis, we concentrated on mapping the material elements of corporate and business unit level business models. In this work, we used a workshop method in which all members of the research team analyzed the same data by reading the material, taking photographs, and photocopies of individual documents, and finally drawing figures and system descriptions that finally resulted in explicit understanding of the characteristics of different business models across time periods and sub-units. Third, we focused on the rhetoric and textual representations of managerial cognition by collecting key documents and interview transcripts that included explicit statements relative to our framework and the cognitive items in it. Finally, again in the context of a specific workshop, we summarized our findings and insights in the form of a graphical illustration of the whole transformation process. The model was then effectively used in our theoretical work resulting in a series of descriptive observations and prescriptive statements potentially useful in future studies and managerial practice. Table I summarizes the correspondence between our research design and research process.

Research site

The origins of Nokia lie in three old companies: Nokia Forest and Power, the Finnish Rubber Works and the Finnish Cable Works, which merged in 1966 to form Nokia Corporation. Despite the fact that the traditional lines of business remained dominant for almost two decades after the amalgamation, it was in the 1960s that the seeds of Nokia's later dramatic changes were planted, in the form of early corporate ventures in various fields of electronics. These endeavors, albeit insignificant in size and largely overshadowed by the other divisions, later evolved into a knowledge base in radiotelephony and switching technologies. Gradually, Nokia's strategies also became more technologically oriented and the electronics division, which had been started in a remote corner of the cable factory, became the focus of investment and growth for the entire corporation in the 1980s (Mäkinen, 1995; Häikiö, 2001a).

Research questions/data + analysis	Analytical approach	Primary data	Secondary data	Interaction with external experts
<i>RQ1.</i> How do business models evolve at the corporate and business unit levels?	Historical analysis aiming to identify the observable changes in the material elements of business models at the corporate and business unit levels	Annual reports, CEO letters, reports by consulting companies, and organizational charts	Historical accounts and descriptions focusing on Nokia's development. Nokia's official history	Two academic seminars including experts in Nokia's history
<i>RQ2.</i> How do management teams cognitively construct the relationship between the tangible elements of the business model and the business performance of a firm?	Qualitative interpretation of texts and interview statements as manifestations of managerial cognitions	Board meeting memoirs, strategic planning documents, personal correspondence of individual managers, interview transcripts	Personal memoirs of former executives, history books, interviews in business magazines, and written CEO statements in annual reports	Workshop with former Nokia managers to verify our interpretation of the textual material
<i>RQ3.</i> What are the mechanisms that allow transformation in business model evolution?	Combination of historical descriptive analysis and qualitative analysis. A dedicated workshop in which authors created and iterated conclusions from the entire research process	Overall combination of archival and interview data	Overall combination of previous academic research and history books	Academic conference presentation including both researchers knowledgeable in Nokia's history, and former Nokia executives and consultants

Table I.
Description of the
research design

In the 1980s, Nokia internationalized its operations while acquiring competences in the fields of electronics through the acquisition of various companies. Some of these purchases proved to be essential, as Nokia's later focus on telecommunication networks was contingent on its early acquisition (1981) of a Finnish company Televa, with expertise in switching and base stations. The focus on mobile phones, in turn, was contingent in Nokia's early involvement in radiotelephones through the founding of a joint venture company – Mobira – with another Finnish company, Salora in 1979 and the subsequent acquisition of the whole of Salora by Nokia in 1984 (Koivusalo, 1995). Conversely, Nokia also made clear miscalculations by getting involved in the consumer electronics business by purchasing large European television and computer manufacturers in the 1980s. The deals proved nearly fatal for the company. Moreover, the corporate situation was further aggravated by the collapse of the Soviet Union, which suddenly took away a large part of corporate sales to Soviet markets, as well as a severe macro-economic recession in Finland at the beginning of the 1990s. In effect, Nokia ended up in a survival crisis.

Nevertheless, extensive divestments of businesses and a new focus on the mobile telecommunications saved the company from demise by the mid-1990s. The mid-1990s, then, saw Nokia thriving with its new focus. The establishment of the pan-European GSM standard proved to be a lifting force for the company, as it was able to find new customers in nascent mobile telecommunications markets (Palmberg and Lemola, 1998; Steinbock, 2001). The internalization that had partly failed with consumer electronics soon became reality with mobile telecommunications as the global markets soared throughout the 1990s (Paija, 2001). Furthermore, Nokia realized early the importance of the corporate brand as well as attractive and user-friendly product design, which gave it a significant competitive advantage as mobile telephones became consumer products as their size and price diminished (Häikiö, 2001b; Steinbock, 2003).

Business model transformation at Nokia

The following descriptions, resulting from the intensive analysis of previously restricted archival data and 14 interviews, represent “snapshots” of three business models in terms of their material elements: the corporate business model of:

- (1) the entire Nokia corporation in 1987 (“NokiaCorp87”);
- (2) the business model of Nokia's mobile phone business unit in 1987 (“NokiaMobile87”); and
- (3) the corporate business model of the renewed Nokia corporation in 1995 (“NokiaCorp95”).

Material elements

Table II provides three summarized snapshots of the material elements of NokiaCorp87 and NokiaMobile87 from year 1987 and those of NokiaCorp95 from year 1995. The business models are described under the general headings, consistent with our framework, of strategy and structure, markets and business network, operations and resources, and finance and accounting systems.

The descriptions provide us indications about how the business model transformation factually occurred. Specifically, they enable us to observe which parts of the new corporate business model (NokiaCorp95) were inherited from the old

	NokiaMobile87	NokiaCorp87	NokiaCorp95
<i>Strategy and structure</i> (Hambrick and Fredrickson, 2001)			
Strategic arena	Mobile telephones	Diverse array of business areas	Mobile telephones and telecommunications
Strategic vehicles	Collaboration to set prevailing standards	M&A activities	Internal product development, joint ventures
Staging	Organic growth	Rapid internationalization	Organic growth
Differentiators	Excellent engineering, technological know-how and customer orientation	High technology orientation and commercialization of the corporation's own and others' technologies	Customer orientation, technology integration, customer solutions
Economic logic	High growth through a balanced product portfolio	Stable growth through a balanced business portfolio (BCG matrix)	Balanced product portfolio, operational excellence
Organizational structure	Focused	Conglomerate	Focused
<i>Business network</i>			
Stakeholder relationship	Straightforward customer orientation and relative freedom from corporate control	Complex multilevel stakeholder network with political, social or governing relationships with a multitude of stakeholders	Relatively straightforward customer orientation, however, with need to pay attention to shareholders and authorities
<i>Operations</i>			
Process architecture	Primitive but developing process architecture with little horizontal processes	Processes mostly oriented towards governance such as investments decisions and M&A activities	Process architecture developed towards coherence and efficiency with horizontal processes
Resource, capability and competence base	High concentration of intangible assets in know-how and skilled personnel	A wide variety and level of assets distributed across multiple business units	High concentration of intangible assets in know-how, skilled personnel and patents
Product and service offerings	Focused on one industry	A multitude of different products and services	Focused on one industry
<i>Finance and accounting</i>			
Capital budgeting	Subordinated to corporate budgeting	Shareholders lenient with budgeting decisions, standard budgeting	Shareholders stricter with budgeting
Financial reporting	Accounting system in line with corporate standards	Complex financial reporting due to diverse organizational structure	Developed management accounting system with financial reporting geared towards investors

Table II.
Material elements in
Nokia's business models

business model of the conglomerate (NokiaCorp87). On the other hand, we are able to identify the emergent, new parts of the new business model at the corporate level. Finally, we gained insights into which parts were actually inherited from unit-level business models, specifically that of the mobile phone unit (NokiaMobile87).

Strategies and structures

The most prominent changes during our period of study occurred in Nokia's strategy and structure. In 1987, NokiaMobile87 was a highly focused business unit that relied on organic growth, engineering know-how, and pan-European collaboration in technology standard development. On the contrary, NokiaCorp87 was engaged in highly active M&A as a part of its aggressive internationalization strategy. Moreover, NokiaMobile87 had a coherent structure and rather few subunits: the two product-based units, i.e. phones for the use of business and phones for the use of governmental authorities, and country- or continent-specific sales organizations. In contrast, NokiaCorp87 had a highly diversified and complex structure with various product-specific business units operating in matrix with various international regional units.

By 1995, however, the corporate business model had transformed radically. NokiaCorp95 manifested a strategy that relied almost exclusively on organic growth, evident in the corporation's almost non-existent M&A activities during 1993-1997. It had also got rid of much of its diversified structure. The traditional business units (rubber, paper, cables, TV's, telecom networks, mobile phones, etc) and the newer consumer electronics (TV) unit, as well as the complex international structure, were expressly replaced with a focused structure of two business units in the telecommunications product area (Nokia Mobile Phones and Nokia Networks) and regional sales offices abroad. Thus, NokiaCorp95 actually inherited both its focused structure and strategy relying on organic growth from NokiaMobile87 (and the related mobile telecom networks unit). In terms of strategy, merely the heavy focus on technological innovation – and commercialization of the corporation's own and others' technological innovation – was transferred to the corporate business model of NokiaCorp95 from NokiaCorp87.

Markets and business networks

With respect to markets and networks, the inheritance of the focused structure from NokiaMobile87 to NokiaCorp95 corresponded to the change of the corporation's diversified target market focus to a narrow focus on telecommunications. Thus, the target markets in focus were expressly inherited from NokiaMobile87 to NokiaCorp95.

The evolution of the business networks involved in the business models, in turn, can be examined by comparing the most relevant stakeholder relationships across the three business models. NokiaMobile87's most important stakeholders were the customers of the business unit (such as telecom operators and mobile phone users), which added to the unit's customer orientation. Furthermore, the unit enjoyed a degree of freedom from corporate control, because it was not "first on the list of divestments" due to the unit's profitability and a "star" position in the conglomerate's business portfolio. In contrast, NokiaCorp87 was entangled in a complex and multileveled stakeholder network. On the one hand, it involved power struggles among Finnish shareholders and new international shareholders, as well as executive engagement in industrial politics in

Europe. On the other hand, the corporation's stakeholder network involved the multitude of external and internal stakeholders related to the multitude of its units and their industries and businesses.

In 1995, in contrast, NokiaCorp95 was less involved in politics, and its stakeholder management was simpler than that of NokiaCorp87 of the previous decade. In NokiaCorp95, however, more attention was still awarded to stakeholders such as international investors and regulation authorities than in NokiaMobile87, in which these stakeholders were rather irrelevant due to its business unit status. The increasingly international investors were given considerably higher emphasis in NokiaCorp95 than in NokiaCorp87, as Nokia was listed in Wall Street in 1994. Yet, an aspect that NokiaCorp95 clearly inherited from NokiaMobile87 was the consideration of customers (mobile phone distributors, telecom operators, phone users) as the most important stakeholders in the business model (Ainamo, 1996). This also evolved into the consideration of suppliers as central stakeholders for customer satisfaction through product quality as well as manufacturing and logistics efficiency and effectiveness.

Operations and resources

Processes of ensuring product quality and supply chain efficiency were concerns to managers in NokiaMobile87, due to problems manifesting as component failures, product deficiencies, and inefficient production, and the resulting customer complaints and cost overflows. Investments were made to develop and improve these processes. Also, the processes of managing intellectual property rights were under development, especially after the business unit ended up in court with Motorola, concerning patent issues in the US at the end of the 1980s. For the executives of NokiaCorp87, these processes were not yet of high concern – with respect to any of the corporations units – but by NokiaCorp95 the product design and quality as well as supply chain efficacy had become central areas of development and competitive advantage. Thus, NokiaCorp95 inherited also the emphasis put on these processes from NokiaMobile87, and further reinforced this emphasis.

In effect, product and operations development became a central function of the whole corporation, much as it had been in NokiaMobile87. Along with improving product quality and operations performance, this manifested in shortening product development project lead times and increased corporate R&D spending and university cooperation, in Finland as well as abroad.

If we compare the operational aspects of the three business models, we can see that the process architecture of NokiaCorp95 has clearly changed from both NokiaMobile87 and NokiaCorp87. There are, however, also similarities due to inheritance. First of all, there are clear similarities in the resource and capability bases as well as product offerings of NokiaMobile87 and the transformed NokiaCorp95. They both rely heavily on intangible assets such as technological know-how, product development capabilities, and skilled personnel – so as to operate and succeed in a single industry, telecommunications. Perhaps the greatest difference between NokiaMobile87 and NokiaCorp95 is, then, the fact that due to almost 10 years' accumulation, the inherited reliance on these intangible assets had become ever more significant in the latter.

From NokiaCorp87, in turn, the transformed NokiaCorp95 inherited especially the strong manifestation of competent people and personnel development as a key aspect of the business model. The corporation's then CEO Kari Kairamo had already in the

1980s managed – through his personal charisma and ambitions towards high technology and internationalization – to render Nokia the most desired employer among its home country’s young and talented people. By 1987, the corporation had also extensive internal training processes in place, even an own “corporate university”. Along with technological knowhow of engineers around the corporation, the time and effort allocation of corporate top executives were seen as paramount to corporate performance – manifested in attempts to continuously improve “time management” of the top executives as well as their mutual communication. All these aspects were inherited from NokiaCorp87 to the “new Nokia” culture and human resource development of the 1990s.

Finally, many of the top executives of NokiaCorp95 had served earlier both at the corporate headquarters (NokiaCorp87) and at the telecommunications business unit of NokiaMobile87 – but none of the other business units of NokiaCorp87. For instance, Jorma Ollila, the CEO in NokiaCorp95 had been the CFO of the corporation in the 1980s, and served as the director of the mobile phone unit at the turn of 1990s. Moreover, Pekka Ala-Pietilä, president of the mobile phones business in NokiaCorp95, had served in various positions of the telecom business units as well as the corporate headquarters in the late 1980s and early 1990. Finally, Sari Baldauf, president of the telecom network business in NokiaCorp95, had served as business developer at the headquarters in the 1980s and later as line manager of the telecommunication networks unit[1].

Finance and accounting systems

There are also several developments in the finance and accounting systems related to the business model worthy of inspection. The multitude of concurrent M&A activity in the 1980s meant that NokiaCorp87’s budgeting and financial reporting were in a state of continuous disarray, or at least the company seemed like a risky investment for foreign investors. Whereas financial reporting was arduous and complex for the conglomerate due to the wide array of business units and continuous M&A activity, it became more straightforward and geared towards potential investors by 1995 when the need for foreign investment and NokiaCorp95’s aspirations for organic growth can be detected in its business model. In budgeting, many of the prevalent procedures of NokiaCorp87, however, moved to the transformed Nokia with little changes, because they were the standards that most of the personnel was used to.

Cognitive elements

Next, we examine how Nokia’s belief system developed and affected business model evolution. Table III summarizes the three business models under analysis according to the cognitive elements of the business model – reputational rankings, corporate recipes, boundary beliefs, and product ontologies. What follows is a detailed analysis of how Nokia’s belief systems evolved between 1987 and 1995 with an emphasis on determining which parts were inherited from NokiaMobile87 business model and which were transferred from the NokiaCorp87 business model.

Reputational rankings

In 1987, there was a large distinction between the reputational rankings prevalent in NokiaMobile87’s managerial cognitions as compared to those in NokiaCorp87. The executives of the latter were occupied with internal reputational rankings, holding

	NokiaMobile87	NokiaCorp87	NokiaCorp95
Reputational rankings	External: Ranking of unit relative to global industry competitors (mobile phone manufacturers)	Within corporation: Ranking of corporation's business units External: Ranking relative to other European (internationalizing) companies	External: Ranking relative global industry competitors (stock-exchange-listed technology, semiconductor, electronics firms)
Industry recipes	Strong organic growth and internal capability development Strong growth and profitability as ultimate goals	Business portfolio management, diversification, and acquisitions International growth and engagement in varied technological/market opportunities as ultimate goals Cash cows in traditional industries to support technology venturing and acquisitions	Strong organic growth and internal capability development (R&D, operations, marketing and IPR management) Strong growth and profitability as ultimate goals – shareholder value
Boundary beliefs	Within corporation: Being one of the favored business units; sharing technological and customer with telecom network business unit External, narrow: Having a strong supplier role and large customers in certain local markets (Scandinavia, UK); having a weak supplier role and few customers in biggest markets (US)	External, wide: Being one of the greatest European technology companies listed in international stock markets; being the greatest company in Finland's business life	External, wide: Being one of the greatest European technology companies listed in international stock markets; being the greatest company in Finland's business life External, wide: Being one of the greatest consumer product companies in global sourcing and marketing
Product ontologies	Mobile phones	Variety of products and businesses	Mobile phones and telecommunications networks

Table III.
Cognitive elements in
Nokia's business models

strong beliefs as to the relative rankings between the corporate business units – destined to determine investment priorities and the degree of corporate attention. Figure 2 vividly illustrates the typical mindset of NokiaCorp87's top management in the form of business unit portfolio laid out in a BCG matrix.

For NokiaMobile87, however, external reputational rankings were more pertinent, because the unit was engaged in fierce international competition – and its managers felt a somewhat secured position within the business unit portfolio of the corporation. The unit's managerial cognition was more externally oriented and the unit had a clear sense of its identity compared to its international industry competitors, or peers. Telecom executives' thorough awareness of the competition field is well exemplified by the detailed analysis of competitive advantages presented in Figure 3.

When it comes to NokiaCorp95, the corporate executives' reference point had shifted to the ranking of the whole corporation relative to global industry peers in the telecommunications industry and related technology industries. This manifests a fairly similar approach to reputational rankings as was manifest earlier in NokiaMobile87. The only major difference is that Nokia executives now evaluated the company's

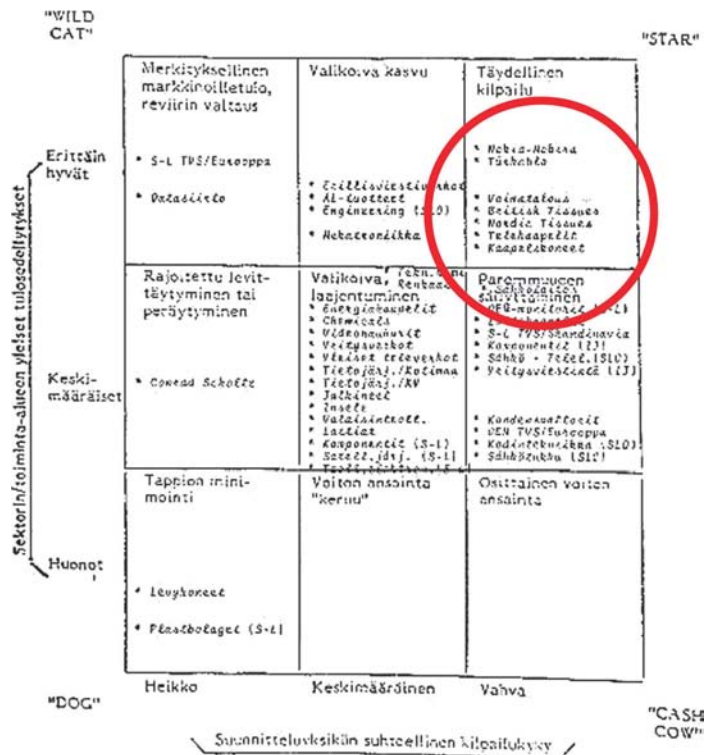
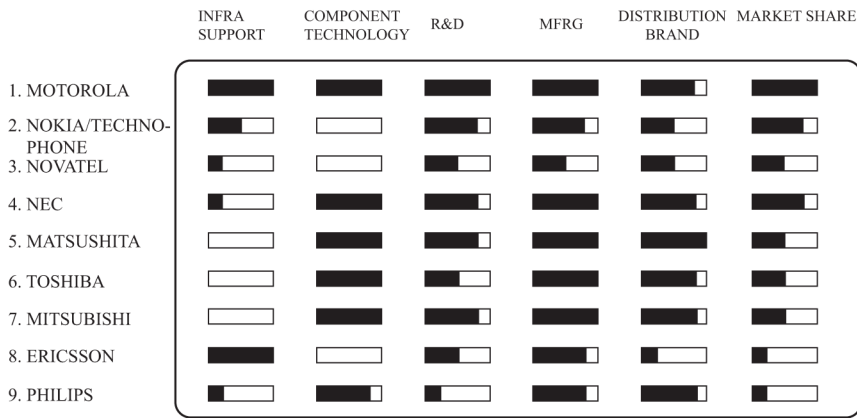


Figure 2. Mobile phone business had the highest reputation among the business units in NokiaCorp87

Sektorin yleiset tulosedellytykset = markkinoiden laatu ja kasvunopeus, odotettavissa oleva teknologinen kehitys, kilpailun keskittynisyys/rajoittuneisuus, odotettavissa olevat muutokset kilpailuolosuhteissa ("shake-out"), lainasääntöine.

Source: Nokia corporate planning round, Nokia Archives (1987)

COMPETITIVE PERFORMANCE ANALYSIS
- relative scaling



Source: Nokia Mobile Phone Vision Day (Nokia archives)

Figure 3.
Analysis of the
competitive performance
of Nokia compared to its
main global competitors

performance on a wider scale, making self-comparisons also to other technology firms besides mobile phone manufacturers. This coincided to some extent with an aspect inherited to NokiaCorp95 from the reputational rankings of NokiaCorp87: executives' tendency to compare themselves to internationalizing firms from Finland and other European countries, mostly in technology-intensive sectors. In any case, the internal reputational rankings prevalent in NokiaCorp87 were gone in NokiaCorp95. The following extracts illustrate this:

It is clear that the mobile phone unit was already in the late 80s one of the "favorite child's" of the executives and the CEO of the corporation ... But within the mobile phones unit, we felt somewhat independent, competing with other regional or global mobile phone manufacturers ... However, the mobile phones unit still did have to compete for attention of the corporate headquarters, as a unit among the others, for investments etc. ... (interview, manager, NokiaMobile87).

Nokia-Mobira is the fastest growing business unit in our corporation (average annual growth rate 33 percent) and simultaneously it aims to reach the highest profitability (annual 34 percent profit margin) ... (Nokia Corporation strategic planning round 1987, 31 May 1987).

Industry recipes

Like many other Finnish corporations during the 1980s, TMT and board members in NokiaCorp87 believed that the corporate future was in large-scale international operations. In addition, a cherished belief was that the corporation's *raison d'être* was to be engaged in varied areas of technological development, which in more or less distant future could also open up new market and growth opportunities:

There was the greater purpose to become a large, international corporate player ... And we admittedly also wanted to maintain some of the various technologies and product areas, just for the sake of sustaining to us opportunities that might rise in future when technologies and markets would develop (interview, executive, NokiaCorp87).

In effect, internationalization, growth, and technological opportunities were to be pursued through engagement in diversified industries and active investments and acquisitions, especially in the fastest-growing industries – essentially with the support of cash flowing from the traditional “cash cow” businesses (e.g. paper, rubber, cables). As an example, the involvement in active M&As in NokiaCorp87’s corporate recipe can best be seen through Figure 4, which portrays the variety of the conglomerate’s acquisitions in 1987.

NokiaMobile87’s industry recipe, in turn, was in sharp contrast with that of NokiaCorp87. The business unit was rather independent from the corporate headquarters and did not participate in the frantic M&A activity of the parent company and many other business units. It mainly relied on organic growth and near-term internal capability development as its business recipe. The recipe of NokiaMobile87 was clearly a practical, down-to earth approach to day-to-day activities that were deemed to be important for the longer-term business success. This mindset is tautologically repeated in the late 1980s strategic planning documents:

Take-off of GSM networks in Europe will depend on the availability, performance and price (as compared to analog ones) of the subscriber terminals and possibilities to extend the capacity of the existing analog networks. Situation varies a lot country by country. In some cases it may be in the interest of both present infrastructure equipment suppliers and

NOKIAN YRITYSBOSTOT 1987	Mmk
Harba GmbH	6,3
American Diversified Capital Corporation, Cue-liiketoiminta	32,0
Mäkitorpan Autoradio, 20 %in vähemmistöosuus	2,5
Conrad Scholtzin lisäosakkeet	13,4
Shaye Communication Ltd 23 %	18,0
Rosendahl Maschinen GmbH	20,0
Conrad Scholtzin lisäosakkeet (0,4 %)	3,4
Tunttajain Kone Oy	20,8
Rosendahl Maschinen GmbH	8,0
Telenokian vähemmistöosuus (49,7 %)	300,0
Maillefer	240,0
Oceanic	240,0
Horda	70,0
Teval Oy	6,7
Melalex, 33 %in osakkuus	16,5
Yhteensä	1017,6

Figure 4. Nokia Corporation followed a classic expansion strategy of a conglomerate throughout the 1980s. This materialized in a high annual number of acquisitions and divestments

Source: Approved investments, Nokia Archives (1987)

operators to delay commercial launching of GSM . . . very tight development schedules and still open specification issues some industry representatives are already flagging a delay of 6-12 months from the planned launch date 6/91 (Nokia Cellular Systems Strategy 3 May 1989).

With regard to NokiaCorp95, the executives of the corporation had by 1995 clearly adopted the industry recipe of NokiaMobile87, but on a much larger scale. Unlike the recipe at the corporate level earlier, managers of NokiaCorp95 now believed that strong growth and profitability were its ultimate goals. By 1995, one had begun to refer to the goal of profitable growth also with the term shareholder value. Moreover, the means that were believed to be best in achieving the goal were also similar to those of NokiaMobile87, albeit reinforced: organic growth and limited if any M&A activities, internal development of operations, R&D, marketing, and even IPR management. On the other hand, what had vanished were not only the beliefs in M&As and diversification as the most viable corporate strategy – but also to a large extent the belief in the idea that one ultimate corporate goal was to be engaged in varied technological opportunity areas and the belief that technology venturing (and acquisitions) were to be funded by cash cow businesses in traditional areas:

Clearly, there was a new focus on profitable, organic growth in the early 1990s, instead of the earlier pursuit of internationalization and size just for the sake of it, through acquisitions . . . Also, what vanished was the ideal of maintaining corporate involvement in a variety of technologies that might, perhaps, turn out to be provide market opportunities in distant future or might be integrated into each other . . . And so did the earlier idea of maintaining traditional businesses as cash cows to fund the expansion of the high tech products . . . (manager, NokiaMobile87/executive, NokiaCorp87).

The new ideal for the corporation in the early 90s was to focus on developing few core technologies and products, while expanding business and markets around them organically . . . (executive of NokiaCorp95).

Boundary beliefs

Boundary beliefs were quite different between NokiaMobile87 and NokiaCorp87 – partly, of course, due to different scope of activities, which placed the two in different environmental contexts. NokiaMobile87's management had a rather narrow focus on its immediate value chain, where the organization's boundaries encompassed only its role relative to its suppliers and customers. The unit was perceived among the strongest suppliers to mobile phone customers in local/small market areas such as Scandinavia, France, and the UK; and among small, underdog suppliers to customers in the USA:

The business idea [. . .] is to supply the public cellular radio operators with equipment and services which facilitate setting up and running of efficient (frequency wise, economically), good quality and reliable mobile communications networks (Nokia Cellular Systems Strategy 3 May 1989).

In contrast, NokiaCorp87 was a large player in both the Finnish and the European scale due to the corporation's heavy internationalization efforts both in product and financial markets as well as active lobbying towards Finnish and European interest groups and authorities. Accordingly, at the corporate headquarters, the corporation was increasingly identified with other European, growing and internationalizing

technology firms that were listed in international stock markets. Yet, there was also identification with a couple of other large industrial companies that constituted the apex of the Finnish corporate world.

By 1995 NokiaCorp95 was a global player, and its identification groups had altered to some extent. The communities to which the corporate executives now saw the corporation to belong were inherited both from NokiaCorp87 and NokiaMobile87, yet also expanded considerably. What was in 1987 still more an ideal identity for NokiaCorp87 than a fact, in 1995 Nokia Corporation was seen as one of the most promising technology companies listed in international stock markets. Inherited and expanded from NokiaMobile87, the corporation was also now seen to be one of the greatest mobile phone (as well as telecom network) suppliers all over the world – even as one of the greatest consumer technology companies overall. On the other hand, gone was the perceived belonging to the underdog category:

I guess we, particularly our CEO, had the desire to become the leading corporation of the large Finnish companies, and be among the leading companies in European industrial circles ... The mobile phone unit, in turn, was a rather small player, belonging to the prominent players mainly in Scandinavia and few other European countries (manager, NokiaMobile87/executive, NokiaCorp87).

In the mid-1990s we started to be a truly global, strong player in both our product areas, mobile phones and networks ... We were also starting to be an internationally recognized company (manager, NokiaTele87/executive, NokiaCorp95).

Product ontologies

In 1987, the product ontologies in the minds of the top managers of NokiaCorp87 were quite varied and unsophisticated due to the diversified nature of its operations. For the corporate management, the details of the products of the various business units were beyond executives' personal understanding – and interest. NokiaMobile87's belief system, in contrast, had a concise product ontology that focused on mobile communications devices. Furthermore, the managers of the unit had a (deep) cognitive understanding of how the attributes, usage, and potential customers of their products fit in with the competition in the markets. This understanding also realized in concrete action plans in the late 1980s:

[1] We must concentrate solely on CMT –competencies and CMT –businesses; [2] We will divest or have divested all unnecessary businesses (Airtime, Mobitex, Cordless, Cue) to ensure that the limited resources and management's time will be used efficiently; [3] We must further strengthen our understanding of the fundamental technological issues ... (Nokia Mobile Phones Strategy for year 1990).

A similar understanding of product ontology could be seen in NokiaCorp95. The company was highly focused on telecommunications and its offerings were among the most advanced in the world. The executives of the corporation were highly involved in pondering what consumers and their business customers wanted from mobile communication products, where production technology was going and how to differentiate their products from those of the competition.

In the board of the corporation, we did not admittedly understand much of the details of the products or technologies ... (director, NokiaCorp87).

The manager of the mobile phone business unit was always very knowledgeable and visionary of the mobile phone products as well as markets . . . He had a strong vision and strategy how to develop the things from the users' and markets' point-of-view (manager, NokiaMobile87).

Discussion: lessons from Nokia business model transformation

Figure 5 summarizes our key findings in visual form. Essentially, the illustration captures the key mechanisms and processes that led (and lead) to radical business model change in a multi-unit corporation, and thus provides answers to our research questions.

According to the above visualization, the key lessons we are able to draw on the basis of our analysis of business model transformation at Nokia can be summarized as follows. Relative to our first research question, at the level of the business environment, we found out that (1) external triggers for change (here technological and market deregulation, the collapse of the Soviet Union market and the severe economic downturn in the beginning of the 1990s; quickly worsening performance at the business unit level in some central business units, especially in Nokia Electronics) acted as strong signals for change both at the level of the corporation and at the level of the business units. This, in turn, created the legitimacy for radical and rapid changes in the respective business models. In line with earlier literatures (McKinley, 1993; Miller and Friesen, 1984; Mone *et al.*, 1998; Tushman and Romanelli, 1985), we formulate the following suggestion, which largely confirms earlier knowledge on organizational transformations and corporate turnarounds.

Lesson 1. A radical business model transformation is triggered by market process signals cognized as radical by both unit and corporate level managers.

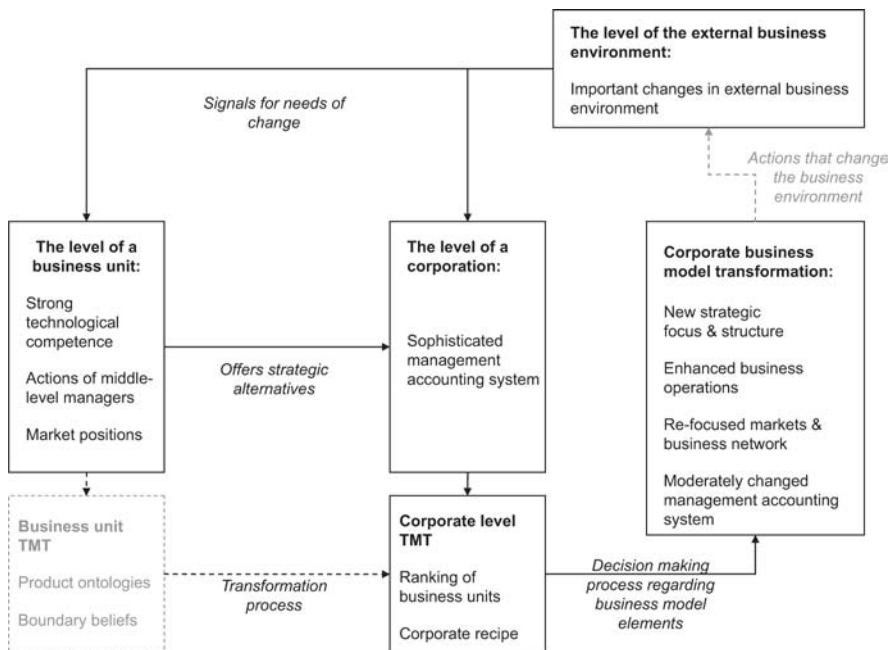


Figure 5.
A process model of
business model evolution
at Nokia Corporation

Relative to our second research question, at the level of the corporation, (2a) the internal ranking of business units (and especially NokiaMobile's advantageous position) according to growth prospects and financial performance allowed, however, the change of the corporate business model. In Nokia's case, the corporate recipe quickly transformed from a diversified conglomerate to a strongly telecom-focused firm, through the inheritance of many elements of the earlier business model of the mobile telecom subunit to the new corporate business model. What is more, the internal ranking of business units was (2b) necessitated by a sophisticated management accounting system, allowing swift reactions to declining business performance after 1988. In the spirit of earlier research on intra-organizational ecology (Burgelman, 1994; Siggelkow and Levinthal, 2003), we may derive the following lessons:

Lesson 2a. Explicit and continuous ranking of business units allows an emergent rise of business model transformation at the corporate level, through inheritance of elements from the best-ranked unit-level business model(s).

Lesson 2b. Swift transformation of corporate-level business model is facilitated by a sophisticated management accounting system that allows the identification of business unit with viable alternative business models vis-à-vis the established corporate-level business model.

Relative to our third research question, at the level of the business unit, Nokia's telecom units (especially Mobira/NokiaMobile) demonstrated very (3) strong technological competence already in the early 1980s. This raised the probability of business model innovations such as the understanding of mass-market prospect of GSM technology. What is more, the technological capability of the middle-level managers allowed divergent actions from official corporate strategy (or recipe) (Burgelman, 1994; Cattani, 2006). In retrospect, we may see that these actions signaled important changes in external business environment very similarly as in the case of Intel in the mid-1980s (Burgelman, 1994). In other words, business unit level managers perceived important changes in markets and the business environment in general, offering concrete strategic alternatives for corporate headquarters. Later, the internal ranking of business units and the credibility of business unit managers strongly influenced which alternatives were preferred at CHQ. In other words, the ranking of telecom-related business units as "stars" in the business portfolio of the corporation raised them as a viable strategic alternative in the face of the inevitable demand for renewal.

Lesson 3. An existing group of routines and capabilities (at business unit level) of a corporation, available for inheritance, is a necessary requirement for the swift refocus of the (corporate-level) business model to successfully fit to the evolving business environment.

Fourth, inductive result of our research focuses on the importance of individual level movement between the different organizational levels. At the level of the top management team and at the level of individual managers, (4) TMT composition (HR system, corporate culture) and actor level cognition (personal values, beliefs and backgrounds) strongly influenced the choice of strategic alternatives and, eventually, business model transformation. In the Nokia case, the decisive factor behind telecom focus was the fact that the TMT at CHQ in the beginning of the 1990s consisted almost

solely of executives with a telecom background. Their product ontologies strongly favored rapidly growing handset and network businesses, in which Nokia also had significant early-mover advantages in technological development. However, it seems evident that the promotion of the former telecom managers to CHQ was as much a consequence as a cause of the rapid selection of the telecom business as the only realistic alternative in the worsening economic situation.

Lesson 4. A necessary mechanism for corporate-level business model transformation is the promotion of the business unit managers and their cognitions to the CHQ.

Conclusions

In sum, our holistic approach to business model transformation led us to highlight some important aspects in the transformation, whereas other aspects (e.g. the change process as individual level evolution) admittedly receive less attention. This, nevertheless, does not corrode the value of our exploratory work, which paves way for future studies. The contributions of our work can be summarized as follows. First, we follow the emergent pattern of studies that aim to use business model as a comprehensive concept in explaining changes in business performance and ultimately firm evolution. In contrast to earlier studies and conceptual papers, our work emphasizes the system dynamics nature of business model evolution. Instead of offering solely a “conceptual map” of firm structures and processes, we have aimed to show and explain how the different elements of a business model are dynamically interlinked over time, through inheritance and development of elements within and across business unit and corporate levels. What is more, we highlight the involvement of the decision-makers (most often TMTs at corporate and unit levels) and their cognitions in mechanisms that explain the causalities between business model changes *vis-à-vis* business performance and market process.

Second, our explanatory logic draws from the evolutionary literature, which has traditionally emphasized the incremental and sometimes haphazard nature of organizational transformations. In contrast to most of the existing literature (Burgelman, 2002; Siggelkow, 2001; Siggelkow and Levinthal, 2003), we argue that even a radical change is manageable if strong trajectories of continuity are involved within material and/or cognitive elements of corporate and business unit level business models (Lamberg *et al.*, 2009). In the present case, such trajectories included manager and executive transfer from one business unit to CHQ and the partial replacement of the earlier corporate level business model with the existing business model of one business unit. This is also a minor contribution to the earlier corporate turnaround literature, which has been indecisive on the role of TMT change in successful turnarounds.

Both of the above contributions are meaningful for managerial practice. On one hand, the holistic and dynamic conceptualization of a business model offers opportunities to analyze, and deeply understand the realistic opportunities for change, and simultaneously prevent overwhelmingly aggressive and sudden managerial interventions. Also, our model highlights the need to have a balance between the *de facto* state of the material elements and the managerial cognitions of the business model. The process model (Figure 5 and the followed lessons), on the other hand, functions as a guideline of radical business model transformation in an acute crisis

situation. The very key message here is that despite the external pressures, firms should maintain consistency in their activities at least in some parts of the organization (Calori *et al.*, 2000). That is, diffusion of crisis management (and attitude) to the healthiest parts of the corporation is potentially hazardous. On the contrary, our work demonstrates that a promotion of a sub-unit level business model is a viable turnaround strategy, especially if it is supported by simultaneous transfer of executives and routines.

Finally, when it comes to the limitations of our research, we note, again, that our account of the business model transformation focuses on highlighting certain aspects of the transformation (especially the changes and inheritance taking place at business unit and corporate levels) – which necessarily means that other aspects (e.g. the change process in individual executives' thinking and actions) receive less attention. Furthermore, there are some limitations to the research methods that we used. Most notably, we opted for gathering and interpretatively analyzing rich historical data, including archival documents – rather than other methods sometimes used in the study of managerial cognition, such as counting managers' frequently-used words, or drawing-up their cognitive maps based on interviews. Therefore, we were not able to provide analyses of the numeric and formal information that those methods could have provided. Nevertheless, we firmly believe that our historical data and its interpretations reflect organizational life (including managerial cognitions) equally well or even better than some of the more formal data. In other words, despite its limitations, the interpretative work with textual manifestations of managerial cognitions (e.g. historical archival documents and memos written by managers) is a valuable and interesting way to study what and how managers actually think – and therefore worked well for the purposes of this article, especially, and its theoretical framework.

Note

1. For a more comprehensive list see Häikiö (2001c)

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