

Chance, Strategy and Change: The Structure of Contingency in the Evolution of the Nokia Corporation, 1986–2015

ABSTRACT

Earlier research has focused on the influence of chance on strategic outcomes, but it has largely ignored the processual role of chance in the emergence of strategic choices. To examine the role of chance in process dynamics that result in radical corporate-level strategic changes, we study the history of the Nokia Corporation between 1986 and 2015. The focus of our empirical analyses is on the event structures that led to the divestment of core businesses at two separate times during this period. We show how multiple strategic change scenarios emerged amid indeterminacy about the future direction of the company, while the eventual strategic choice converged on one of the scenarios due to the influence of chance conjunctures. This convergence demonstrates how chance can unlock problematic decision-making situations not only by opening up new development paths but also by selecting out and blocking alternative scenarios, even high-probability ones. Our results suggest that chance is as an endogenous characteristic of strategic change processes, one which exhibits an identifiable ‘structure of contingency’ rather than being a random, independent, or exogenous shock without any identifiable structure.

Keywords: Strategic change; chance; corporate strategy; event structure analysis; Nokia Corporation; strategy process research, structure of contingency

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INTRODUCTION

Where does radical strategic change emerge from? This question has been a central one since the beginning of strategy process research (Burgelman, 1983; Pettigrew, 1985, 1987). Answers have consisted mainly of accounts emphasizing either visionary leadership and the bold choices of corporate managers or evolutionary variations in the corporate environment (see, e.g., Hrebiniak & Joyce, 1985). However, the role played and influence exerted by one fundamental aspect of any change or adaptation process, whether natural or social adaptation, has received less attention: that of *chance*.

A growing body of strategic management literature touches upon the role of chance, but most of it has focused on the impact of chance on strategic *outcomes*, such as organizational innovations, performance, survival, or demise (see Denrell, Fang, & Liu, 2015). Only a few studies have addressed the impact of chance on strategic behavior and choices (Baum, Shipilov, & Rowley, 2003; Cattani, 2006; de Rond & Thietart, 2007; Rao & Greve, 2018). Yet even these studies have tended to look more into strategic conduct or opportunities elicited by chance rather than at specific strategic choices determined by chance. These studies have also tended to consider chance as exogenous happenstance that lacks any notable structure, rather than focusing on the structure of how chance may exert its influence on strategic choices and how it is intertwined with the process of making strategic choices. This influence mechanism of chance, also called the “structure of contingency” (e.g., Ermakoff, 2015), is the focus of the present research.

In studying the mechanisms and processes which link chance and strategic choice, we use the concepts of chance, conjuncture, and contingency. Building on de Rond and Thietart (2007: 535), by *chance* we refer to “...an event happening in the absence of any obvious design.” When it comes to the precise content of chance events, this definition is flexible as long as the event itself is unforeseen to the actors. Chance takes effect through the *conjuncture* of events (Ermakoff, 2015), which is the intersection of two events or event sequences. However, this definition says little about the content of this intersection, and it is this content which is examined in more detail in our empirical study. Finally, *contingency* is a weak form of chance since it enables one to understand the potential events that could happen, the actualization of which is dependent on adjacent events. Contingency also becomes realized through conjunctures of events.

The present study focuses on the following research question: How might the strategic choices of a corporation unexpectedly emerge from chance? Our theoretical grounding draws from the literature on chance in strategic management (e.g., de Rond & Thietart, 2007) as well as from recent organizational sociology (Collins, 2017; Ermakoff, 2015, 2017; Lara-Millán, Sargent, & Kim 2020). We focus especially on event sequences that represent incidences of non-pure chance, what Ermakoff (2015) calls “contingencies.” In contrast to pure chance events, contingencies may have already existing, partial interdependencies¹ with event sequences related

¹ The partial interdependency of two event sequences is also implied in the latter aspect (b) of the definition of contingency by Merriam-Webster : “(a) an event (such as an emergency) that may but is not certain to occur” and which is “(b) something liable to happen as an adjunct to or result of something else” (<https://www.merriam-webster.com/dictionary/contingency>).

to the firm's strategy process. Despite such interdependencies, these sequences can inject substantial elements of chance into the firm's strategic decision-making process.

We address the research question through a historical case study of a prominent global company, the Nokia Corporation. We concentrate our empirical analyses on a radical, unexpected strategic choice that Nokia made twice in two decades (the 1990s, the 2010s): the choice to get rid of the firm's previous core business areas and refocus on business areas that were not previously in the firm's core interests. In the early 1990s, Nokia eliminated its core businesses of consumer electronics and information systems to focus on mobile phones and telecom networks. Then, in the early 2010s, Nokia sold off what had become its uncontested core business at the turn of the 2000s, mobile phones, to Microsoft. To onlookers as well as many Nokia executives themselves, these strategic choices came as a surprise. By analyzing these radical strategic choices, we can shed light on how chance-influenced processes led Nokia to divest its former core business twice in a period of merely 20 years. Subsequently, we move towards an enhanced theoretical understanding of the structure of contingency.

Our research offers three main contributions to the research on chance, strategy processes, and radical strategic change. First, we elucidate the role that chance plays in determining strategic choices in organizations, augmenting the previous literature that has tended to focus on the role of chance in shaping organizational outcomes (Denrell, Fang, & Zhao, 2013; Graebner, 2004; MacKay & Chia, 2013). Second, for the emerging research addressing the processual role of chance in strategic management (Baum et al., 2003; de Rond & Thietart, 2007; Korn & Baum, 1999), we demonstrate that chance occurrences may not only open up new strategic choice options for the firm, but they may also close down options and lead the top management to choose a surprising alternative (see Burgelman, 1994). Third, for both of the

aforementioned research streams, our findings suggest that the influence of chance may be realized not only by unexpected macro-environmental incidents on organizations and on their decision-makers, but also through unexpected agency

The paper's structure follows the conceptual logic we have adopted. We first discuss the role of chance in corporate strategy, which results in an elaborated understanding of the opportunities and constraints the current state of research offers. To complement the existing conceptual understanding and build tools for our empirical work, we draw from historical sociology, especially Ermakoff's (2015; 2019) theoretical suggestions, to develop a theoretical framework. This framework drives our historical research and subsequent event structure analysis of Nokia's evolution, which represents a revelatory case of how and why chance appears as a mechanism in strategic change. The results of our empirical research and theorizing reveal the structure of contingency to be based on the mutual coevolution of emerging chance events and the already existing ideas contained in potential scenarios and strategic directions.

CHANCE AND CORPORATE STRATEGY

Chance is a widely recognized phenomenon in strategy process research (see, e.g., Denrell et al., 2015; de Rond & Thietart, 2007; MacKay & Chia, 2013) and in managerial practice. Studying and managing chance and its consequences is challenging because chance events typically emerge without any obvious design. Events such as the collapse of the Soviet Union, COVID-19, and an erupting volcano blocking air traffic all had a dramatic impact on multiple businesses in a myriad of ways. The current literature has focused on the role of chance from two different perspectives: chance and strategy outcomes, and chance events and strategic choices. In the

following section, we demonstrate why our research focuses on the relation between chance and strategic choice as well as provide a basis for our choice of concepts and approaches.

Chance and Strategy Outcomes

To date, earlier strategic management research examines how chance events influence strategic outcomes such as organizational or individual performance. This focus can also be seen in the review of management research on chance by Denrell, Fang, and Liu (2015), wherein all the sub-streams of strategic management literature listed address the role of chance on strategic outcomes, for example “firm growth,” or “performance and risk taking”.

Previous research on the role of chance events in influencing strategic outcomes has also varied considerably according to the locus of chance addressed. On the individual level, there are recent studies focusing on the influence of chance in comparison to entrepreneurial learning on individual entrepreneurs’ performance (Frankish, Roberts, Coad, Spears, & Storey, 2013), the influence of digital systems on individual innovators’ accidental discovery performance (Austin, Devin, & Sullivan 2012), the influence of scientists’ serendipitous interpersonal encounters on knowledge production (Lane, Ganguli, Gaule, Guinan, & Lakhani, 2021), and the influence of serendipity on leadership success (Winter, 2012). On the level of innovations and technologies, Greve and Seidel (2015), for instance, addressed the influence of early chance events on the later diffusion of innovations. In turn, recent organization-level studies have addressed the influence of industry-level and macro-economic chance events on organizational failure (MacKay & Chia, 2013), the influence of initial chance events in the accumulation of sustained competitive advantage (Denrell et al., 2013), the influence of acquired firms’ top management on serendipitous value creation from the acquisitions (Graebner, 2004), and the influence of random variation on firm performance. See, for example, Fitza (2014, 2017;

Quigley & Graffin, 2017) on CEO effect, and Henderson, Raynor and Ahmed (2012) on the influence of this variation over the long term.

These studies vary considerably on the assumed interdependence between the chance event and a firm's emergent strategy. Many of the studies addressing the role of chance in organizational performance have adopted either the population ecological–evolutionary view of chance as natural variation (e.g., MacKay & Chia, 2013) or the mathematical view of chance as statistical, random variance (e.g., Denrell, 2005; see also random-walk models of performance, e.g. Denrell, 2004; Henderson et al., 2012; and other random statistical processes, e.g. Botazzi & Secchi, 2003, 2006; Sutton, 2002). Some studies adopt both of these views (natural and statistical variation), such as those under “organizational ecology” in Denrell, Fang, and Liu's (2015) review (Barnett, 2008; Denrell, 2003; Denrell & Kovács, 2008; Denrell & Shapira, 2009; Levinthal, 1991). These studies can be considered to assume full, endogenous dependence between the chance events and the organization's emergent strategy and its outcomes.

The assumption of chance events as being fully independent of the firm's strategy process is much rarer, but is present, for instance, in the analyses of rare macroeconomic events behind organizational failure (MacKay & Chia, 2013) and of the contextual factors and luck behind leaders' success (Winter, 2012). Even the assumption of chance as being semi-independent from strategy processes is rare. However, it occurs especially in studies of entrepreneurs' and innovators' search behavior and serendipitous, accidental discoveries (e.g., Dew, 2009; Lane et al., 2021) and in the organizational search of strategic opportunities in strategic factor markets (e.g., Denrell, Fang, & Winter, 2003). That is, when entrepreneurs, innovators, or organizations engage in the strategic search for new opportunities, it makes the

discoveries, however accidental or unexpected, made in the search partly interdependent on the search strategy itself.

Chance Events and Strategic Choices

The present study focuses on the much less studied stream of research addressing the influence of chance events on strategic choices or decisions. On the individual level, Rao and Greve (2018) studied the influence of rare disastrous events on citizens' decisions to form retail cooperatives. In terms of innovations and technology, Cattani (2006) addressed the influence of luck and historical accidents on later speciation and application of technology.

On the organizational level, we are aware of only two earlier empirical studies and one conceptual study addressing the influence of chance on the strategic decisions of an organization. Baum, Shipilov, and Rowley (2003) empirically analyzed the role of chance in interfirm partnering behavior and found that firms in different sub-networks form connections not only strategically but also by chance. In a similar vein, Korn and Baum (1999) showed that the multi-market contact strategy of commuter airlines was the result of not only strategic choice and imitation but also chance. Finally, in their conceptual study, de Rond and Thietart (2007) demonstrate how chance events often open up avenues for new strategic alternatives or choices. However, in addressing emergent strategic behaviors or patterns (Baum et al., 2003; Korn & Baum, 1999) or strategic alternatives (de Rond & Thietart, 2007), none of these studies explicitly focus on actual strategic choices or decisions.

Furthermore, all the aforementioned studies address chance that has an endogenous relationship with the organization's strategy. In Baum et al. (2003) and Korn and Baum (1999), chance does not refer to any particular incident or event, but to the partly unplanned emergence of the organization's strategy. De Rond and Thietart (2007), in contrast, refer to unexpected

incidents (e.g., Pfizer’s observation that a medicine originally developed for heart angina happened to elicit penile erections as a side effect) underlying later strategic initiatives (the development of an impotence drug). Yet even in this case the incident referred to is endogenous to the organization’s strategy. If Pfizer’s strategy had not involved developing the said medicine in the first place, the side effect would not have emerged.

There is clearly a gap in our knowledge regarding the influence of chance on strategic choices, wherein chance events occur mainly on the organizational level and are semi-independent from the firm’s emergent strategy. To address this gap, we turn to the broader sociological and historical literature to develop a theoretical framework to guide our study. This is because this literature has already developed insights into how to address this issue (see Ermakoff, 2015, 2019).

THEORETICAL FRAMEWORK

To analyze what role chance played in Nokia’s strategic choice processes, we build upon two literatures: the historical sociology literature addressing chance processes, following the work of Ermakoff (2008, 2010, 2015, 2019; see also Collins, 2017; Lara-Millán et al., 2020; Sauder, 2020), and the strategic management literature addressing chance and luck (e.g., Denrell, 2005; de Rond & Thietart, 2007; Hoffman & Ocasio, 2001; Lampel & Shapira, 2001; MacKay & Chia, 2013). The key concepts adapted from these literatures are visualized in Figure 1.

Insert Figure 1 about here

Most prominently, our theoretical framework is derived from Ermakoff’s (2015) analysis of the “structure of contingency.” Ermakoff (2015) does not provide a precise definition for either

contingency or *the structure of contingency*. The former broadly refers to chances or chance events since they are largely unforeseen to the involved actors, and the latter refers to the assumption that the mechanism and process by which chance emerges and exerts its influence on agents' strategies and behavior may have a structure which can be analyzed. According to Ermakoff (2015), contingency as a form of chance is not *fully* exogenous, random happenstance—like lightning from a blue sky—which just happens (or whose influence just happens) without any mediating mechanism or identifiable structure. Rather, contingency involves event sequences that have a structure of their own, as well as interdependencies with other event sequences which the strategic agents are involved in. In doing so, Ermakoff (2015) prefers the terms “contingency” and “conjuncture” in order to emphasize the point that these chance incidences are not fully exogenous or fully independent happenstance in relation to other strategic event sequences. For such fully independent happenstance, Ermakoff (2015) uses the term “pure chance,” but refrains from analyzing it. This is because the lack of structure in how pure chance intervenes with an agent's strategy makes it rather uninteresting phenomenon to analyze.

In line with Ermakoff's theoretical ideas of the structure of contingency, we focus on the mechanisms and processes of how non-pure chance influences the strategic choices of an organization. The notion of non-pure chance, adapted from Ermakoff (2015), is also consistent with the definition of chance by de Rond and Thietart (2007: 535): “Chance refers to an event happening in the absence of any obvious design”. Indeed, as discussed in the Introduction, the word “obvious” here can be considered to refer to a partial, but not necessarily a full independence of the event sequences representing chance from other strategic event sequences affecting the organization. It also refers to the fact that the emergence and influence of chance

may have some structure, even if that structure is not obvious or easy to discern or understand. Ermakoff (2015) utilizes these notions to describe a process that leads strategic decision-makers to arrive at a decision whose emergence even they themselves do not fully understand, let alone expect.

A related key concept of Ermakoff's (2015) is the "moment of collective indeterminacy" in decision-making. We refer to *periods* of collective indeterminacy instead of *moments* to emphasize that in corporate strategy-making, a state of decision-making indeterminacy may extend over several months or years, rather than days or hours. References to such periods of indecisiveness are common in the strategic management literature as well. Corporate managers may lack a unified understanding of how to act and why, for instance, when existing decision-making procedures cease to provide guidance for strategic actions (Collins, 2017; Kaplan, 2008), when managers become uncertain about their standpoints in a decision-making collective regarding how to respond to a novel situation (Bogner & Barr, 2000; Combe & Carrington, 2015; Floyd & Lane, 2000), when conflicts emerge among decision-makers (Smith & Tushman, 2005), or when managers simply do not know what to do next (Lara-Millán et al., 2020; Mosakowski, 1997; Cohen, March & Olsen, 1972). Such situations are not uncommon for decision-making processes related to major strategic change, which existing decision-making routines do not provide guidance for.

In our framework, the period of collective indeterminacy is demarcated by a series of *strategic change scenarios* elicited by *scenario-eliciting events* pertaining to the firm's *emergent strategy*. The period of collective indeterminacy begins when the top management first identifies a need for major strategic change and then recognizes a certain new strategic course of action as a viable strategic change scenario but remains undecided about whether to really

actualize that action. The scenario itself is elicited by scenario-eliciting events that substantially challenge the firm's current strategy and business model. The scenario-eliciting events can be more or less unexpected to the management beforehand. They may or may not have appeared, for example, in a priori strategic risk analyses. In our analysis of Nokia, we further classify the scenario-eliciting events in terms of whether they were largely unexpected or unforeseen to the top management a priori. We label the former, largely unforeseen events as contingent (scenario-eliciting) events. This classification helps determine whether the initial unexpectedness of a scenario contributes to the convergence of the eventual strategic choice on that scenario.

The first scenario that emerges is not often the one which is eventually chosen to be actualized, and some of the scenarios may cease to serve as viable strategic alternatives before the eventual strategic choice is made. However, ever since the emergence of the first scenario, when strategic decision-makers get "trapped in a state of mutual uncertainty", they also become, progressively, "open to different alternative futures" (Ermakoff, 2015: 115). Several scenarios are then likely to emerge before the eventual choice is made. Moreover, not all of the scenarios necessarily exist, at any point, as explicit, formal choice scenarios (e.g., in strategy documents). Instead, they may only exist in the minds of the decision-makers or in their informal discussions with their peers, shaped by the decision-makers' individual abilities and experiences (de Rond & Thietart, 2007; Ocasio, 1997). As a group, the decision-makers remain uncertain about which of the emerged scenarios should be actualized.

The period of collective indeterminacy ends when the viability of one of the scenarios dominates that of the others, or the viability of all other scenarios is substantially reduced or eliminated. We presume that in a case like Nokia, in which the eventual strategic choices were surprising to the decision-makers themselves, it is this stage of the process where

contingency will exert its primary influence. Specifically, we analyze the influence exerted by *parallel event sequences*, which intersect with the alternative choice scenarios. Adapting Ermakoff's (2015) term of "open-ended conjuncture", it is these intersections which we refer to as *conjunctures*, and which we presume to constitute the primary factors that influence the eventual strategic choice. However, whereas a pure chance incidence would imply full independence of the two intersecting event sequences, the conjunctures we analyze in this study only imply partial independence between the scenarios (and the events eliciting them) and the parallel event sequences intersecting with the scenarios. This means that earlier the two event sequences may have also shared certain common root events. Rather than any unexpected event in isolation, it is the unexpected intersection of event sequences that eventually lead to the surprising strategic choice. In this way, the likelihood that certain scenario becomes realized is contingent upon parallel event sequences and the conjunctures that determine which scenario becomes realized.

In the strategic management literature, the partial independence of the parallel event sequences corresponds with the notion that rare, exogenous events also become partly endogenous to strategic decision-making from the moment actors begin to pay attention to their occurrence (Hoffman & Ocasio, 2001) and/or when they affect the agency of groups or individuals (Bogner & Barr, 2000). The events in the parallel event sequences do not necessarily have to be dramatic events either. Even micro-level changes in decision-making group composition or minor interaction episodes between group members may tip the decision-making balance towards one of the alternative scenarios (Thietart, 2016; Winter, 2012). Although we do not study such micro-episodes, the theoretical logic is the same: the parallel, partly exogenous event sequences that intersect with the alternative scenarios tip the balance towards one of the

alternative scenarios, and in so doing, serve to open up a lock-in situation, close the period of collective indeterminacy, and facilitate a strategic choice that results in a new strategic direction.

The resolution of collective indeterminacy, partly through chance, hence leads the decision-makers to converge on a strategic choice, as the participating actors align around a single scenario that becomes actualized (Ermakoff, 2010, 2015). The choice is freely made by the actors but conditioned by chance (de Rond & Thietart, 2007). In addition to ending the period of collective indeterminacy, the making of the strategic choice also ends a period of strategic change, providing that the strategic choice made is implemented. Analytically, the implementation of a scenario therefore constitutes the end of a strategic change period. We apply this framework and its key concepts to study the unexpected strategic choices that Nokia has made during the past quarter of a century. We next elaborate on the methodological choices that enabled us to study Nokia's unexpected strategic choices.

METHOD

Research Design

To develop insights into the question of how major strategic choices can emerge from chance, our study combines historical (Argyres, De Massis, Foss, Frattini, Jones, & Silverman, 2020; Ermakoff, 2015; Godfrey, Hassard, O'Connor, Rowlinson, & Ruef, 2016) and process research methods (Jarzabkowski, Lê, & Spee, 2017; Langley, 1999). Nokia is a particularly suitable context to study this process for three reasons. First, we had unique access to data on both time periods in which Nokia surprisingly divested its core businesses (1986–1996 and 2004–2015). For the first period, Nokia granted us unconditional access to its corporate archives. For the second period,

executives who had personally experienced the period could be contacted and interviewed, giving us access to informants with recent memory of the events.

Second, despite the differences in the types of available data for the two periods, the fact that a radical strategic change was repeated enabled us to replicate many of our data analysis and interpretation procedures for the two processes. Our research design resembles what Aguinis and Solarino (2019) call an exact replication, facilitating our abductive theorizing on the decision-making processes (see Bamberger, 2019). In other words, it allowed us to bracket, analyze, and compare two unexpected strategic changes made by a single corporation in order to develop emergent theory (Eisenhardt, 1989; Langley, Smallman, Tsoukas, & Van de Ven, 2013).

Third, considering the genre of case study methodology, we use Nokia as a revelatory (Yin, 2003) and exceptional (Ermakoff, 2014) case. The magnitude of changes in Nokia's strategy "magnifies relational patterns that in more mundane situations lack visibility" (Ermakoff, 2014: 223). Simultaneously, our unique access to Nokia's archives makes our study revelatory because we had "access to a situation previously inaccessible to scientific observation," making the study "worth conducting because the descriptive information alone will be revelatory" (Yin, 2003: 43).

In summary, the three aspects described above, combined with preexisting conceptual and analytical ideas from Ermakoff and de Rond and Thietart sensitized us and provided us "a foundation for [our] new study" (Fisher & Aguinis, 2017: 441; see also Ketokivi & Choi, 2014).

Research Context: Nokia Corporation in 1986–2015

This study focuses on Nokia and its two periods of strategic change that took place between 1986 and 2015. During the first period from 1986 to 1996, Nokia first focused on developing new core business areas in consumer electronics and information systems through a number of large acquisitions. After a period of investment driven growth, Nokia completely reoriented its strategy

by divesting the core businesses it had built in the previous years, and refocused solely on the telecom business, specifically mobile phones and network technology. As a result, Nokia enjoyed formidable growth and dominated the global telecom industry, thanks to its then cutting-edge mobile phones based on the Symbian operating system as well as its superb supply chain management capabilities (Doz & Wilson, 2018).

During the second period from 2004 to 2015, Nokia's dominance of the telecom industry came to an abrupt halt as it missed the emergence of application-oriented operating system platforms for smartphones. After a series of strategic moves that attempted to salvage its market position, which included collaboration with Intel and Microsoft, Nokia's top management eventually decided to sell the entire mobile phones business to Microsoft in 2014. Besides being the second time in less than twenty years that Nokia divested its core business, the decision to sell the mobile phones business to Microsoft made it even more surprising. This is because the previously successful Symbian OS was originally developed to fend off Microsoft from the mobile telecom market, and Nokia's top management had seen Microsoft as a key competitive threat for almost two decades (Ollila & Saukkomaa, 2013).

Data Collection

We collected data by utilizing three techniques that are commonly used in historical case studies (Kipping, Wadhwani, & Bucheli, 2014): collecting secondary research and public literature written about the company, gathering archival documents from company archives, and conducting semi-structured interviews with key actors.

Secondary sources. Nokia has ranked among the largest companies in Finland for decades. At its peak, Nokia represented up to four to five percent of the entire country's gross domestic product. Accordingly, much of the prior literature on Finland's industrial, economic, and

corporate history in general provides background information about Nokia's history. We first familiarized ourselves with this background material. Besides the general literature sources, we collected a variety of qualitative and quantitative material focusing on the history of Nokia in particular. This resulted in a significant collection of Nokia-specific material, comprising altogether over 100 academic publications, biographies of its ex-CEOs, studies by former Nokia managers, and a number of academic pieces of research. The corpus also included Nokia's annual reports, SEC filings, and a large number of articles in professional magazines.

Archival data. Concurrent with the collection of secondary data, we conducted an extensive search of Nokia's corporate archives. These archival collections had been previously restricted to internal use, but we were permitted unconditional access to all corporate archival documents up to the year 2000. This extensive material includes protocols of top management team and board meetings, business and strategic analyses, correspondence between managers and business units, and other memoranda. Due to our focus on unexpected strategic changes and the preceding periods of collective indeterminacy, we concentrated on analyzing archival documents related to business portfolio investments and divestments during the late 1980s and early 1990s. Our access to archival data was limited to the years up to 2000 due to the recent nature of the events and their partly confidential nature. Therefore, interviews as well as recent biographies of Nokia's executives played a larger role in analyzing the strategic changes that took place after the millennium, in the second period of analysis.

Interviews. To complement our archival and secondary sources, we conducted in-depth interviews with people who had served in top management at Nokia during the study period. Each interview lasted between 30 and 80 minutes and they were semi-structured in nature. The interviewees were initially asked to express their general views about Nokia's evolution during the

period. A typical question we asked was “Recalling Nokia’s history, what’s your view of the most significant changes that occurred in the company’s businesses during that period?” Subsequently, as the interview progressed, the interviewee was asked to reflect on specific episodes of business portfolio changes, investments, acquisitions, and divestments at Nokia. We specifically questioned the interviewees about any decision-making in which the interviewee had personally been involved. Altogether, we conducted interviews with 12 executives and board members involved in the first strategic change episode and 13 executives, board members, and specialists that had intimate knowledge about the second episode. The interviews were recorded and transcribed verbatim.

Data Analysis

We combined historical (e.g., Heise, 1989; Mahoney, 2012) and process research (e.g., Langley, 1999; Pentland, 1999) methods to perform the analyses. This combination allowed us to pinpoint and reconstruct periods of collective indeterminacy and analyze the role that chance played in resolving the indeterminacy and in converging the decision-making towards the strategic choice to sell the core businesses. Our analysis proceeded in four stages that were iterative in nature, as is typical with historical research (Kipping & Lamberg, 2017; Kipping et al., 2014).

Stage 1: Identifying periods of collective indeterminacy and alternative scenarios.

Ermakoff (2019) suggests that analyzing contingency as a property of historical processes requires “(a) the ability to identify moments of collective indeterminacy in which collectives waver between different behavioral stances [...] and (b) the ability to gauge the range of possible collective scenarios and their likelihoods at different points in the process” (p. 595, italics in original). To do this, we first wrote narratives to familiarize ourselves with the data and make sense of the events (Pentland, 1999) that occurred during the two studied periods. When doing

this, we also set temporal brackets (Langley, 1999) to outline the points of time when Nokia's top management started to perceive the need for potentially radical change in the current strategy. These points occurred around 1990 for the first period and 2010 for the second. The initial recognition of a radical change and the eventual decision to divest core businesses were treated as the periods of collective indeterminacy that in both cases lasted approximately five years. A focus on periods of five years of collective indeterminacy was justified because strategic business portfolio decisions of large corporations typically take years to form. This is in contrast to political voting decisions studied by Ermakoff (2015), which may swing and converge within days or hours. This approach is also consistent with Ermakoff's (2015) point that contingent conjunctures can last over periods of time.

When analyzing events during the periods of collective indeterminacy, we followed Ermakoff's (2010, 2015) suggestion to focus on identifying alternative strategic choice scenarios as the events unfold. When conducting temporal tracing, we paid attention to the identification of possible decision-making scenarios that emerged at different points of the process before the final outcome was realized. This was done to avoid explaining the eventual decision as a necessity or as a fully logical outcome of a decision-making process, and more importantly, to enable the analysis of the role of chance in the decision-makers' convergence on the eventual historical decision (instead of the alternative scenarios).

We identified the alternative decision-making scenarios from documents and interviews pertaining to the periods of collective indeterminacy. Not all of the alternative scenarios could be found in any one decision-making document at a certain point in time. Rather, the scenarios emerged at different points and some of them were also overruled or ceased to be viable already before the final choice was made. The somewhat ambiguous nature of the

scenarios was accentuated by the fact that different scenarios were often conceived of or supported by different actors or actor groups. We describe these scenarios at the beginning of the analysis section.

Stage 2: Identifying events eliciting alternative scenarios. After identifying periods of collective indeterminacy and alternative scenarios through the development of narratives, we used event structure analysis (ESA; Corsano & Heise, 1990; Griffin, 1993; Heise, 1989) to trace event sequences that led to the emergence of alternative scenarios (Ermakoff, 2015). ESA is a particularly suitable method for this tracing since it forces the researcher to systematically unpack narratives into events and then reconstruct causal interpretations of how the events are related to each other (Griffin & Korstad, 1998). This is done by determining which previous event are required for the current event to occur that ultimately produces a diagram of event relations (Heise, 1989).

In the first stage of ESA, we focused on events that pertained to Nokia's *emergent strategy* (see the framework in Figure 1). These are events that substantially challenged the firm's current strategy and business model and led to the emergence of the alternative *strategic change scenarios* identified above (analysis stage 1). The initial coding of events was based on the historical narratives developed in the previous analytical stage and covered the two periods in full. To identify relevant events from the narratives, we paid attention to a wide variety of events: incidences external to Nokia (e.g., the collapse of the USSR), occurrences partly external and partly internal to Nokia (e.g., the mounting losses of a business unit), and internal events (e.g., change of business unit leader; prior strategic decision). Coding the events also enabled us to triangulate them across multiple sources in order to reduce the limitations that reliance on singular sources can generate (Kipping et al., 2014).

After the initial coding of events, we used the computer program ETHNO² to construct the event sequences. The strength of using ETHNO is that it forces the analyst to systematically consider whether each previous event is required for the current event to occur (Griffin, 1993) which is done by answering a series of yes/no questions. In practice, the computer-assisted analysis process moves forward in the event chronology while simultaneously identifying which of the previous events are prerequisites for any given event that has happened.

After the initial event sequences had been constructed by one of the authors, the other authors checked the initial analysis together. While assessing the initial analysis, new events were iteratively added to the sequences so that all prerequisites for oncoming events were met, while events that were not part of a sequences were removed. This followed the procedure of iterative addition and removal of events and re-interpretation of event relationships during the analysis process (Heise, 1989). The analysis process was continued until the model fit our data and necessary antecedents were specified for each of the events.

The analysis process generated a network of necessary antecedent events for the alternative strategic change scenarios, which created a comprehensive understanding of how the scenarios emerged. To show transparency in how events and event relations have been coded, a full list of coded events, prerequisites for each event and sources used for triangulation are presented in Tables B1 and B2 in Appendix B. In the analysis section below, we present simplified visualizations of these analyses (Figures 2 and 3), while Figures A1 and A2 in the Appendix A visualize the full event structures. For the simplified visualizations, we included a further coding of the events, according to the theoretical framework (Figure 1): interpreting

² Available at: <http://www.indiana.edu/~socpsy/ESA/>

whether each of the key events was largely unexpected to the top management. The largely unexpected events are highlighted in the figures as *contingent scenario-eliciting events*.

Stage 3: Closure of scenarios. The next stage of the ESA aimed to identify events and event sequences that were not directly related to Nokia's emergent strategy but exerted significant influence on the viability of alternative strategic change scenarios. While the previous stage focused on the emergence of different scenarios, this stage focused on the "closure of alternative futures" (Ermakoff, 2015: 111), and the eventual decision to realize one of them. This closure was assumed to happen when parallel event sequences intersected with the alternative strategic change scenarios, influencing their viability. By doing so, these parallel and intersecting event sequences were considered to gradually lead towards the realization of one scenario.

In practice, through triangulation of the various historical sources, we aimed to interpret how these parallel event sequences influenced Nokia's top managers' perceptions of the viability of the different scenarios. It is the intersections of the event sequences that eventually lead to the unexpected strategic choice (Ermakoff, 2015). Certain initially promising scenarios could be left unrealized, while other less likely scenarios were eventually realized. The intersections of these parallel event sequences then led to the resolution of collective indeterminacy and to an unexpected strategic choice. In analyzing these intersections, we also paid special attention to the role of agency of individuals and different groups of individuals: "The focus on contingency moments pins down the sudden susceptibility of collective behavior to individual agency factors" (Ermakoff, 2015: 105), as "chance factors affect collective behaviors and social outcomes by affecting the agency of particular individuals" (Ermakoff, 2015: 114).

The parallel event sequences identified in this stage are included in detail in the same figures (Figure A1 and A2 in Appendix A) as the event sequences pertaining to Nokia's emergent strategy. The simplified visualizations of Figures 2 and 3 below include the key events leading to the aforementioned intersections, zooming in on the intersections constituting the chance conjunctures leading to the strategic choice. Similarly, as in the previous stage, we also included, in the simplified visualizations, an indication of whether certain events in the parallel event sequences were largely unexpected to the top management.

Stage 4: Analytical generalization and theory development. In the last stage of our analysis, we revisited our theoretical framework (Figure 1) in light of the analysis. By comparing the two periods, we aimed to identify commonalities in the role that chance played in the two periods leading to the surprising strategic choice. In this way, we arrive at analytical generalizations of the issue which could be potentially valid beyond the case of Nokia (Eisenhardt, 1989; Langley et al., 2013). The final analysis stage also corresponded with Ermakoff's (2015) notion of generalizing the overall event sequences by grouping the idiosyncratic, micro events involving particular actors into more abstract categories, that is, "subsuming actors and their actions into broader categories" (Ermakoff, 2015: 95). In so doing, we iteratively framed the broader categories at an appropriate level, so that as many observations as possible from both periods could fit into those categories. These detailed comparisons across the two time periods (presented in detail in Appendix C) enabled us to develop theory on the influence that chance can have on strategy making process.

EMERGENCE OF STRATEGIC CHANGE SCENARIOS IN THE TWO PERIODS

In what follows, we present our analyses of the two periods of collective indeterminacy at Nokia (1986–1996 and 2004–2015), and subsequent radical strategic changes to divest the company's

core businesses and refocus on previously non-core businesses. Our analyses are guided by the theoretical framework presented above. For both periods, we first analyze the *emergence of the alternative strategic change scenarios* during the period of collective indeterminacy as well as the immediately preceding *scenario-eliciting events* in the firm's emergent strategy process that led to the emergence of those scenarios. After presenting this analysis of how the scenarios emerged in both periods, we turn to analyzing the *closure of the alternative strategic change scenarios* for both periods in the following section. In this second analysis, we focus on the parallel sequences of events, which are partly exogenous of the previous event sequences identified in the emergence section but which nevertheless *intersect* with the former, reducing the viability of the alternative scenarios, one by one, ultimately leading to the convergence of the strategic choice on one of the scenarios. Please note that in this section we only present the key events associated with the emergence and closure of change scenarios. For the full event structure analyses of the two periods, see Figures A1 and A2 in Appendix A.

First Period: Emergence of Alternative Strategic Change Scenarios

Background events in 1986–1988. In the mid-1980s, the Finnish financial markets were progressively deregulated, which enabled companies to acquire financing from the global financial markets with fewer restrictions than before. Partly empowered by the availability of foreign capital and new international shareholders, Nokia's top management outlined "Corporate Vision 1990," which stated that strong corporate growth will be pursued, primarily through international acquisitions. While the Paper and Mobile Phone business areas were directed towards streamlining and trimming, the top management had the vision that the business areas of Consumer Electronics (primarily TVs) and Information Systems (primarily PCs) would be key to growth. This was because there was a widespread belief in Europe that these areas would drive the

development of future technologies, industries, and businesses. Accordingly, towards the end of the 1980s, these two business areas became considered as the core businesses of Nokia.

Early in 1987, Nokia's stock was also listed on the London Stock Exchange, which further increased the pressure on its management to grow internationally. To redeem these expectations and put the corporate vision into action, Nokia acquired two European TV manufacturers—French Oceanic and the German Standard Elektrik Lorenz (SEL) — to strengthen the Consumer Electronics business. For the Information Systems business, Nokia acquired the data and computer systems division of the Swedish technology company Ericsson, called Ericsson Data. Smaller acquisitions were also realized in the Cable business area, and the Tele Networks business area.

With this salvo of acquisitions, the role of Consumer Electronics and Information Systems as the core business areas was reinforced, even though the Cable, Tele Networks, and Mobile Phones business areas were also considered to have strong growth potential. For Consumer Electronics, the acquisition of Oceanic and SEL made Nokia the third largest producer of TV sets in Europe and enabled the firm to engage in negotiations with the Japanese Hitachi about collaboration. However, constant changes in the business area's management as well as the scrapping of an important cost-cutting initiative hampered the profitability of the TV business. These troubles deepened when large European companies started to dump their inventories on the market and move their production to Asia. In parallel with the troubles of the TV business, the newly acquired Ericsson Data was also being restructured and the management attempted to pursue a joint venture with another European PC manufacturer. Nevertheless, in December 1988, Nokia's top management presented, to the firm's Board of Directors, dire financial figures for both Consumer Electronics and Information Systems. This indicated that difficulties in the PC

and TV businesses had rapidly become a threat to the future of the whole company. A period of collective indeterminacy was about to start.

The following sections, as well as the upper part of Figure 2, summarize the events leading to the period of collective indeterminacy from 1990 to 1993, which led to the emergence of four alternative strategic change scenarios (the choice between which was subject to the collective indecisiveness). According to the theoretical framework, we also identify which of the preceding events were *contingent* scenario-eliciting events, and which were *non-contingent* scenario-eliciting events. The contingent events are defined as largely unforeseeable events that challenge the firm's current strategy and business model while eliciting a strategic change scenario. The non-contingent events are those that consist of somewhat foreseeable events that have a similar effect of eliciting a strategic change scenario. Finally, by analysing various documents and interviews, we identified four alternative strategic change scenarios that were considered by some of the involved actors as viable options during the period of collective indeterminacy. These scenarios were (a) "Entering a corporate partnership in Consumer Electronics and/or Information Systems", (b) "Pursuing a turnaround of Consumer Electronics and/or Information Systems", (c) "Selling the company off as a whole or in pieces", and (d) "Focusing on Mobile Phones, Tele Networks, and Cables (divesting all other businesses)". However, the presence and viability of these scenarios changed throughout the period of collective indeterminacy so they should not be viewed as simultaneous decision options that were obvious to all of the involved actors.

Insert Figure 2 about here

Non-contingent events eliciting alternative strategic change scenarios in 1988–1992.

One non-contingent event that preceded and gave rise, partially, to all four scenarios was the mounting unprofitability of the Consumer Electronics and Information Systems business areas at the end of the 1980s. The mounting losses followed the aggressive acquisitions Nokia made a couple of years earlier (Consumer Electronics: Oceanic; Information Systems: Ericsson Data). Another non-contingent event behind the emergence of the scenario of “entering a corporate partnership in Consumer Electronics and/or Information Systems”, in particular, was the preliminary partnership talk that was initiated in the late 1980s between Nokia’s top management and Hitachi regarding the TV business. Likewise, in the Information Systems business area, there were initial partnership talks with Honeywell, Olivetti, and ILC. Even if these were no more than initial talks, Nokia’s top management came to see such a partnership or joint venture as a viable strategic scenario which would potentially help the core businesses solve their profitability problems.

Another alternative scenario, “pursuing a turnaround of Consumer Electronics and/or Information Systems,” emerged around the same time. This was essentially a do-it-yourself alternative for the aforementioned scenario of engaging in a partnership when it comes to solving the mounting unprofitability problem of the core businesses. Another non-contingent event also preceded the emergence of this scenario: Nokia’s divestitures of three business units at the turn of 1980s and 1990s: Rubber (excluding tires), Paper (mainly tissue paper), and Power (mainly hydro energy production). These divestitures released capital and managerial resources that would be needed in potential turnaround attempts of the Consumer Electronics and Information Systems businesses.

Contingent events eliciting alternative strategic change scenarios in 1988–1992. In

contrast to the two scenarios above, the emergence of the third scenario, “selling the company off as a whole or in pieces,” was fueled by a contingent scenario-eliciting event when the Finnish economy entered the most severe banking crisis in its history in 1990–91. Due to this largely unforeseeable, contingent event, Nokia’s largest shareholders, the commercial banks KOP and SYP, spiraled into financial troubles of their own during the banking crisis. When Ericsson, one of Nokia’s main competitors, contacted Nokia’s main shareholders in 1991, indicating its interest in acquiring parts of the firm, the shareholding banks’ interest in selling Nokia only increased. In turn, because the CEOs of these banks served as the Chairman and Vice-Chairman of Nokia’s Board of Directors, the banks’ interest in selling Nokia, either as a whole or in pieces became a viable scenario for the rest of Nokia’s top management as well.

Finally, a contingent event also played a role in eliciting the scenario “focusing on Mobile Phones, Tele Networks, and Cables,” along with the aforementioned non-contingent event of the mounting losses of the Consumer Electronics business. The first unforeseeable event was the sudden demise of the USSR in 1991. Another contingent event was how quickly Nokia’s sales recovered from the demise of the export market to the USSR, even though its Tele Networks and Cables businesses were traditionally heavily exposed to the loss of that market. By 1991–92, however, especially the Tele Networks business had started to enjoy strong market demand in GSM mobile networks and equipment due to the deregulation of the telecommunications market in Europe and elsewhere (leading to an increasing number of mobile telecom operator customers for Nokia). This concurrent demand growth for mobile network equipment compensated for the vanishing demand of fixed-line telecom equipment in the USSR.

Furthermore, the concurrently growing demand for mobile handsets of the Mobile Phones business area also served to compensate for the diminished exports to USSR.

Second Period: Emergence of Alternative Strategic Change Scenarios

Background events: 2004–2010. After refocusing the business portfolio and divesting Consumer Electronics and Information Systems as well as Cables in the late 1990s (see the sections below), Nokia retained Mobile Phones and Tele Networks as its main business areas. In the early 2000s, the Mobile Phones business was further divided into three sub-areas—Mobile Phones (basic devices), Multimedia (advanced devices and services), and Enterprise Solutions (business-to-business offerings) —so that each sub-area could pursue growth opportunities more independently. Around the same time, the Mobile Phones business units experienced some trouble with their major clients or resellers, the telecom operators. The telecom operators were unhappy about Nokia's entry into the mobile service markets, which had traditionally been the operators' territory. They were also unhappy about Nokia's sluggishness in introducing new types of device models (e.g., clamshell and ultra-thin model). These events led Nokia's management to focus on the development efforts of new mobile phones on phone models utilizing the Symbian OS, which in the mid-2000s was the state-of-the-art OS in the industry. The development of phones for other OSs was sidelined.

In 2006, Olli-Pekka Kallasvuo, the previous Chief Financial Officer, was appointed as the new CEO of Nokia. Jorma Ollila, CEO since 1992, moved to serve as full-time Chairman of the Board of Directors. At this point, Nokia was the clear market leader in the global mobile phones market, and made record profits in 2007. Kallasvuo was therefore not willing to make major changes in the strategy of the Mobile Phones business area. Accordingly, when the first iPhone was released by Apple in 2007, Nokia's top management considered it a marginal player

unlikely to threaten Nokia's market leader position. In the Tele Networks business area, Nokia joined forces with Siemens to form Nokia Siemens Networks (NSN), which began operating as a separate corporate entity. Due to the formation of NSN as well as an intensified internal rivalry between the three different sub-units of Mobile Phones, the corporate organization was restructured at the beginning of 2008 into two major units: Devices & Services and NSN. Soon after, however, Nokia acquired the location and mapping solution company NAVTEQ. This meant that the corporate structure now included, again, three major business units: Mobile Phones, NSN, and NAVTEQ.

In 2007, not only did Apple introduce the first iPhone with its own iOS, but Google announced the formation of the Open Handset Alliance, with the goal to develop new handset standards as well as a new OS for smartphones. This initiative led to the launch of Android OS in 2008. Nokia's top management responded to these events by acquiring the full ownership of Symbian Ltd. and the Symbian OS from other mobile phone manufacturers (e.g., Samsung), as well as by opening up the Nokia OVI store for selling and sharing services and apps for Symbian-based mobile phones. However, a more pressing concern for the management was the 29 percent drop in the sales of the Devices & Services unit in the last quarter of 2008. This drop was initially explained as resulting from the global financial crisis in late 2008. As a response, CEO Kallasvuo initiated immediate cost-cutting actions in all business units. However, it remained a question mark whether changes beyond mere cost-cutting were needed in Nokia's strategy and its Mobile Phones business area in particular. By 2009, Nokia's top management was entering a second period of serious collective indeterminacy.

Similarly as was done for the first period of collective indeterminacy, the following sections and the upper part of Figure 3 summarize the events leading to the period of collective

indeterminacy around 2010. Again, four strategic change scenarios emerged as primary alternatives: (a) “Accelerating and boosting the development of the Meego operating system,” (b) “Choosing Google’s Android operating system as the main operating system,” (c) “Utilizing both Microsoft’s Windows Phone and Google’s Android operating systems,” and (d) “Selling Mobile Phone and Smartphone units to Microsoft.” In the following section, we briefly describe the events eliciting these scenarios, while classifying these events, as above, into contingent events and non-contingent events.

Insert Figure 3 about here

Non-contingent events eliciting alternative strategic change scenarios in 2009–2012.

In the first period, the mounting losses of one of the core business units (Consumer Electronics) was a non-contingent event that preceded the emergence of all the alternative strategic change scenarios. In a similar way, in the present period (around 2010), there was, again, one event that served to partially elicit all four scenarios mentioned above. This non-contingent event pertained to the mounting problems with the Symbian OS, used as the main OS in Nokia’s mobile phones. Specifically, the problems were two-fold: externally, customer demand for smartphones based on the Symbian OS was falling, and internally, the software and product development processes were becoming increasingly inefficient due to the technical complexity of Symbian.

Another non-contingent event was behind the emergence of the first alternative scenario, “accelerating and boosting the development of Meego operating system.” This event, non-contingent because it was a decision by Nokia’s top management, was the initiation of a development effort, together with Intel Corporation, for a new smartphone OS, called Meego, in

2009. This initiative continued, and was integrated with, Nokia's earlier project to develop a new OS for high-end mobile phones, Maemo.

The second alternative scenario, "choosing Google's Android operating system as the main operating system," had no additional preceding events other than the aforementioned mounting problems with Symbian OS's falling customer demand and development inefficiency. However, later on, when the development efforts of Meego turned sour (as described below in connection with the closure of the scenarios), this scenario's viability was temporarily reinforced.

Contingent events eliciting alternative strategic change scenarios in 2009–2012.

Behind the emergence of the third alternative strategic change scenario, "utilizing both Microsoft's Windows Phone and Google's Android operating systems," in contrast, was the contingent events mentioned above: the new, unexpected competitors entering the mobile phone market. Indeed, Apple's entry to the market with the iPhone in 2007 and Google's entry with the Android OS in 2008–09 were largely unforeseeable to Nokia's management. By 2009, however, the iPhone had already established itself as a legitimate competitor in the market, and what was even more concerning for Nokia's management, its old competitors like Samsung, HTC, and Huawei started to heavily promote Android devices to consumers, telecom operators, resellers, and app developers in 2009, too. In 2010, Microsoft also re-entered the market by launching its own OS for smartphones, Windows Phone. Microsoft had tried to enter the market in the 1990s with an OS called Windows CE, which it had offered to Nokia as an OS for Nokia's early smart devices. At that time, Nokia had declined the offer, not wanting to become highly dependent on a single OS provider only, as the PC industry has become dependent on the Microsoft Windows

OS. But now, with the availability of the Android OS along with Windows Phone, the possibility to utilize both of these OSs in Nokia's phone models became a more viable scenario.

At any rate, another contingent event after the emergence of the previous scenario was the decision by Nokia's top management to enter in an exclusive strategic partnership with Microsoft in early 2011. This decision would have been unforeseeable and inconceivable to Nokia's top management still one or two years earlier, given its aforementioned earlier strategy to avoid becoming highly dependent on Microsoft. What may have made this decision easier was the appointment of Stephen Elop as Nokia's new CEO in 2010. Elop had previously been employed as an executive at Microsoft.

Ultimately, the final scenario of "selling Mobile Phone and Smartphone units to Microsoft," which Nokia's top management eventually converged on, emerged through the same contingent events as the previously described alternative scenario ("utilizing both Microsoft's Windows Phone and Google's Android operating systems"). Additional, non-contingent events eliciting this fourth scenario included the continued decline of smartphone sales despite the Windows Phone partnership, as well as failed further attempts to restructure the development and manufacturing efforts of basic cell phones and smartphones.

CLOSURE OF SCENARIOS THROUGH CONJUNCTURES IN THE TWO PERIODS

As identified in analysis stage 3, the following sections describe the parallel event sequences which were partly independent of the of the event sequences which were described in the previous section, and which pertained to Nokia's strategy and led to the emergence of the alternative strategic change scenarios. These parallel event sequences eventually intersected with the alternative scenarios and through this intersection substantially affected the viability of the

scenarios as choice options. In effect, these parallel, intersecting event sequences gradually led to decision-making convergence on one of the alternative scenarios only, scenario (d) in both periods.

First Period: Closure of Scenarios Through Conjunctures

Between 1990 and 1995, several parallel event sequences intersected with the different strategic change scenarios which had previously emerged. When it comes to scenario of “entering a corporate partnership in Consumer Electronics and/or Information Systems,” an intersecting parallel event sequence started from the suicide of Kari Kairamo, Nokia’s CEO at the time, at the end of 1988. As a consequence, the top management of Hitachi pulled out from the initial talks about a potential partnership with Nokia’s Consumer Electronics business. The death of Kairamo undermined the trust of Hitachi’s management in Nokia as a prospective partner.³ Because Nokia had no other prospective partners lined up for the Consumer Electronics unit at that point due to its severe unprofitability, this event sequence largely eliminated the entire scenario of entering a partnership from the set of viable strategic change scenarios to be considered for future.

The aforementioned event sequence leading to the elimination of the scenario of entering a corporate partnership also led to the elimination of the next scenario, “pursuing a turnaround of Consumer Electronics and/or Information Systems.” This domino effect was due to the fact that from 1990 to 1993, it became clear to the top management of Nokia that various do-it-yourself turnaround attempts of the two poorly-performing business units were not sufficient to make the businesses profitable without an appropriate strategic partnership. Because

³ Note that it is the unexpected change in the preferences and behavior of Hitachi’s management we consider as a partly independent, interacting event sequence involving external agency that affected the viability of the aforementioned scenario to enter a corporate partnership, not the fact that a preceding event involved the sudden death of the CEO, too. At the same time, the intersecting event sequence is only partly independent of the event sequence originally leading to the emergence of the scenario. This is because the mounting heavy losses of the Consumer Electronics and Information Systems most likely also contributed to the depression of the CEO before his suicide, and because the initial talks with Hitachi also contributed, originally, to the emergence of the scenario itself.

no equally serious negotiations were conducted with other potential partners after Hitachi, the turnaround scenario came to be eliminated as a consequence of the partnership scenario being eliminated.

With regard to scenario (c) “selling the company off as a whole or in pieces,” a parallel event sequence took place after the aforementioned negotiations between Nokia’s top management, its main shareholder banks KOP and SYP, and the Swedish competitor Ericsson, about selling Nokia to Ericsson, ended without an agreement. KOP, which had for decades considered it absolutely necessary to have its CEO in Nokia’s Board of Directors as a counterpart to the CEO of its main rival SYP, was now so keen to sell its stake in Nokia because of its own financial troubles that it was also ready to accept losing its position in Nokia’s Board of Directors. KOP sold its Nokia shares to the insurance company Pohjola and KOP’s CEO stepped down from Nokia’s board. As the remaining shareholders did not have as pressing a need to sell their Nokia stakes as KOP had had, the perceived viability of the sell-off scenario for Nokia’s top management (including the board now without KOP’s CEO) was substantially decreased.

Whereas the viability of each of the first three alternative scenarios was substantially reduced or eliminated due to the aforementioned parallel event sequence, there was also a parallel event sequence that boosted the perceived viability of the remaining scenario, “focusing on Mobile Phones, Tele Networks, and Cables (divesting all other businesses).” That is, another event sequence partly originated from the same event above, whereby the major shareowner, KOP bank, sold its stake in Nokia and the CEO of KOP left his position as vice-chairman of Nokia’s board. With the CEO of KOP having exited the board, the remaining large shareowners (e.g., SYP, Pohjola) sitting on the board found a new kind of harmony in 1991. This led to an

agreement on the need to appoint a new CEO for Nokia in 1992, Jorma Ollila. Ollila's appointment boosted the viability of the scenario to focus on Mobile Phones, Tele Networks, and Cables—and divest the other businesses including Consumer Electronics. This was because Ollila had previously served as the head of the Mobile Phones unit. The Mobile Phones unit also operated in the same or related industry as Tele Networks and Cables. Because Ollila had much more personal familiarity and trust in these businesses than the other remaining businesses, including Consumer Electronics, the perceived viability of the scenario to focus on Mobile Phones, Tele Networks, and Cables was boosted. Because the viability of all alternative scenarios had been simultaneously reduced, the top management's strategic choice eventually converged on this scenario.

Second Period: Closure of Scenarios Through Conjunctures

Similarly we did for the period 1990 to 1995 above, we describe here the parallel event sequences that intersected with the previously emerged alternative scenarios in 2010 to 2015, and substantially influenced the viability of the different scenarios as choice options.

Timewise, the first such event sequence, intersecting with the alternative scenarios in 2010 to 2015 was initiated when new entrants unexpectedly intervened in the smartphone market: Apple with its iPhone in 2007, Google with its Android OS in 2008–09, and Microsoft with its Windows Phone OS in 2010. The proliferation of Android devices, in particular, by Samsung, HTC, and Huawei severely undermined the market share of Nokia's Symbian OS-based smartphones. This eventually led Nokia's Board of Directors to initiate a search for a new CEO in the spring of 2010 to replace Olli-Pekka Kallasvuo, the former CFO who was not thought to be aggressive enough in the new competitive situation. The main external candidate was Stephen Elop, a Microsoft executive, while the main internal candidate was Anssi Vanjoki,

the head of Nokia's smartphone unit. The final choice was Elop, possibly partly because of Vanjoki's previous underestimation of the strategic challenge posed by Apple and Google. The appointment of Elop as CEO soon led to the first of the previously emerged scenarios turning sour. Namely, the scenario of accelerating the development of Meego OS as a new state-of-the-art smartphone OS was an idea originally advocated by the runner-up CEO candidate Vanjoki. Combined with unexpected disruptions in the collaborative performance with Intel Corp. in developing the Meego system, this scenario was soon eliminated by the new CEO. As an alternative to pursue instead, Elop convinced the board that had just hired him to enter into a partnership with Microsoft and to adopt its Windows Phone system as the main operating system for Nokia's smartphones.

Nokia's smartphone sales did not get sufficiently back on track, however, even after the successful market launch of Nokia's Lumia-branded Windows Phone devices in 2011–12. As a result, two previously emerged scenarios re-entered in parallel for consideration: (b) "choosing Google's Android OS as the main operating system", and (c) "utilizing both the Microsoft's Windows Phone and Google's Android Oss." Two event sequences involving sudden, unexpected undertakings by the strategic partner Microsoft came to intersect these two scenarios during the three following years. In 2013, Microsoft surprisingly announced the launch of Surface, its own tablet computer. Although the product did not include mobile phone functionalities, it made Nokia's top management wary of Microsoft's plans: whether the former software company intended to become a hardware manufacturer, or perhaps even acquire some of Nokia's competitors (e.g., HTC) to produce its own smartphones. This event sequence actually increased, temporarily, the viability of the scenario (c) of Nokia's starting to develop Android phones as well as Windows Phones.

Less than a year later, another unexpected action by Microsoft led to a substantial reduction in the viability of the same scenario to utilize both Android and Windows Phone OSs, as well as the previously mentioned scenario of shifting to Android altogether. Namely, in 2013, Microsoft's CEO Steve Ballmer contacted the new Chairman of the Board of Nokia, Risto Siilasmaa, to initiate talks about Microsoft's potential acquisition of the mobile phone business units of Nokia. On the one hand, this indicated to Nokia's top management that Microsoft was most probably not eager to acquire any of Nokia's smaller competitors. On the other hand, it made it clear that the continuation of the talks would require ending any plans to replace Microsoft's Windows Phone partly or entirely as Nokia's primary software platform with Google's Android.

This essentially left Nokia with only one remaining scenario to choose: "Selling the Mobile Phone and Smartphone units to Microsoft." Besides the gradual elimination of the three alternative scenarios, this scenario was further encouraged by one more event sequence, this one involving further changes in Nokia's top management. In 2008, the largest shareholders of Nokia had already appointed Risto Siilasmaa, the founder and CEO of the security software company F-Secure, to the Board of Directors of Nokia, primarily due to his experience with the agile development of software and computer applications. Consequently, when Jorma Ollila announced he was stepping down as chairman, the largest owners appointed Siilasmaa to take up the position. Siilasmaa was much less attached to the mobile phone business units than Ollila was, who saw himself as the creator of the once hugely successful mobile phones business. He also had more experience of working with the telecom operator customers from his own company F-Secure. This made it easier for Siilasmaa to be open to selling the phone business units to Microsoft, further encouraging Nokia and its board to eventually make this radical

decision. Indeed, after protracted and challenging negotiations with Microsoft, the deal to sell the mobile phone business to Microsoft was announced in September 2013.

DISCUSSION

Summary of Findings

As our main research question, we asked: “How might the strategic choices of a corporation unexpectedly emerge from chance?” Our analysis elucidates the role that chance played in leading Nokia’s top management to make the radical strategic choice to get rid of its previous core businesses twice within a relatively short time period. Chance elements influenced this process in two ways. First, during a period of collective indeterminacy, certain unforeseeable contingent events contributed to eliciting alternative, often totally novel strategic change scenarios—one of which was the scenario managers eventually chose to be realized. Second, a number of parallel event sequences as well as the preceding event sequences eliciting the aforementioned scenarios intersected with Nokia’s strategizing. These intersections gradually led to the elimination of all but one of the scenarios, and therefore led to the convergence by top management on that very scenario, while at the same time ending the period of collective indeterminacy. Based on our analysis, we consider that the second mechanism of chance played a more substantial role in Nokia’s case. This is because the contingent nature of the scenario-eliciting events cannot alone explain the eventual choice of a specific scenario. In contrast, the fact that there was a number of conjunctures reducing the viability of all other scenarios than the chosen one, suggests that these conjunctures were a sufficient condition for the unexpected strategic choices Nokia’s top management made.

Reconsidering Hrebiniak and Joyce’s (1985) classic framework on the sources of organizational adaptation, our results demonstrate that “adaptation by chance” (p. 338) does not

necessarily mean that the influence on organizational adaptation by both “environmental conditions” and “strategic choices” is low. In contrast, our research implies that Nokia’s organizational adaptation, under the influence of chance, was greatly impacted by the strategic choices its top executives made. These choices, in turn, were influenced by several chance events partially arising from the business environment. Relatedly, the present findings also shed light on the independence vs. interdependence of these chance conjunctures concerning the organization’s strategy process. Earlier research has tended to view chance to be either fully independent of the firm’s strategy process (e.g., exogenous macro-environmental incidents, shocks or other disturbances) or fully endogenous to it. The present findings demonstrate that chance conjunctures flow from event sequences that are semi-independent of the firm’s strategy. Their influence on strategic change involves, at the same time, top managers’ leadership vision (Teece, 2007) and strategic planning procedures (Grant, 2003), as well as intra- and extra-organizational evolutionary forces (Burgelman, 1994).

Contributions to Research

The first contribution of our research targets the lack of studies on the influence of chance on the process of making strategic choices. To date, most research has looked at the influence of chance on strategic outcomes such as organizational innovations, performance, or survival (cf. Denrell et al., 2013; Graebner, 2004; MacKay & Chia, 2013). Chance appears as a relatively mundane element in strategy processes. This is especially due to its processual nature. Our results suggest that firms may endogenize chance and its effects efficiently and transform them into decision-making parameters in the strategy process, such as in the work of eliminating competing choice scenarios. From a practical perspective, it is interesting but not surprising that chance (from random pure chance to almost predictable contingencies) can become endogenous to an

organization's strategy process. Classically, military strategy and tactics have always dealt with chance and contingency as an inherent characteristic of the strategy process. Our findings reveal the processual richness associated with the endogenization process and, subsequently, demonstrate the sensitivity of strategy processes to move from indeterminacy to completely novel directions.

As the second contribution, our findings demonstrate that chance can influence outright strategic choices of organizational decision-makers. This complements the few earlier studies that address the influence of chance on strategic behaviors (Baum et al., 2003; de Rond & Thietart, 2007; Korn & Baum 1999) by showing that chance may not only open up new strategic choice alternatives for the firm (de Rond & Thietart 2007) but it may also close down alternatives earlier regarded as dominant ones. Accordingly, our findings emphasize that chance may not only influence strategic choices by generating mutations and variations in strategic alternatives and options (Denrell et al., 2015; MacKay & Chia, 2013), but it may also centrally affect the selection process between strategic alternatives, and even the retention of chosen strategies.

As the third contribution, our findings elucidate the interrelationship of agency and chance in shaping strategic choices. Previous research (e.g., Cattani, 2006; de Rond & Thietart, 2007; Lane et al., 2021) has seen the influence of chance to be realized by unexpected macro-environmental incidents on organizations. In contrast, our research implies that chance may also exert its influence *through* the unexpected agency of different actors. In the case of Nokia, chance was realized through the agency of the representatives of large shareowners, former and new CEOs and chairmen of the board, current and prospective business partners, and new competitors entering the industry. At the same time, our findings question whether strategic

choices are really made by the top management of the firm, since the external actors' agency often exerts such a decisive influence on those choices through chance. In other words, chance affecting top managers' choices may originate in the unexpected agency of (semi)external actors.

Limitations and Future Research Avenues

The main strength of studying revelatory cases, such as the one of Nokia, is that they can “magnify relational patterns that in more mundane contexts lack visibility” (Ermakoff, 2014: 223). This also results in a limitation since there is a risk of overestimating the importance of explanations that are drawn from exceptional circumstances (Collier & Mahoney, 1996). We emphasize the pre-theoretical nature of our research and recognize the need to further study how chance manifests in other strategy-making situations in different industries and organizations. We also recognize the need for further research focused on topics we identified as important but which were difficult or impossible to study with our data.

The first idea for future research concerns time and timing. Regarding the role of timing, we propose subjective time (Shipp & Cole, 2015; Shipp & Fried, 2014) and its interplay with the structure of contingency to be an important research topic. For instance, how do individual actors respond to different kinds of chance incidents in terms of perceived urgency? Our use of historical data constrained us from focusing on these issues in a more detailed way. Ethnographic field studies or simulations would allow this aspect of contingency to be studied in more detail. Timing is important because our results imply that chance-based processes have a strong dependence on recent organizational outcomes (Page, 2006: 106). Accordingly, discrete decisions (e.g., hiring a new CEO or envisioning a new strategy) may result in a multiplicity of interdependent causal effects which emphasize the importance of the individual and shared cognition of time and, subsequently, the timing of such key decisions.

Our second suggestion for further research is methodological. Following the recent debate on transparency and replication in qualitative research (see Pratt, Kaplan, & Whittington, 2020), we suggest that incorporating considerations of contingency can strengthen the transparency of qualitative research. By examining moments of collective indeterminacy and emerging alternative strategic choice scenarios, a researcher is required to examine and report alternative ways of seeing situations that are (at least partly) the source of indeterminacy. This gives credence to the different ways in which change processes evolve. In future research, more micro-level historical data should be used to be able to tap deeper into the intentions, views and actions of individuals in the strategy process. These data could include interpersonal e-mails, minutes of top management team and board meetings, and interview data on the personal views and influence of key actors. Altogether, they would allow the researcher to better recognize how chance conjunctures actually emerge at the micro level.

Managerial Implications

While Levinthal and March (1993: 110) famously argued that “[...] magic would be nice, but it is not easy to find”, our findings imply that chance conjunctures may resemble a form of ‘strategic magic’ in simultaneously representing internal leadership and external determinism—unlocking difficult choice situations to bring about radical strategic change. Accordingly, our findings offer in several ideas that would be immediately valuable in the strategic management of firms. First, our findings foreground the importance of understanding and mapping scenarios when facing indeterminacy. While Nokia’s top managers did not directly control the final decision, they developed the scenarios from which the selection was made. This does not necessarily mean that all of the involved decision-makers were knowledgeable of the potential

scenarios since different actors conceived alternative scenarios for resolving the situation. Therefore, in situations that are influenced by collective indeterminacy and chance, understanding and mapping the scenarios becomes crucial so that the involved actors know the scenarios from which the final selection is made. This brings structure and control to situations that are riddled with indeterminacy.

Second, our research provides insights into the nature of events that on the surface seem to be largely unexpected. Understanding the underlying structure of contingency helps managers to direct the emergence of strategic change processes, rather than treating chance as fully exogenous shocks to strategic decision-making. Managers need to map out potential influences that might affect the decision-making process. Knowledge of the scenarios and factors that might influence the final decision could at least partially alleviate collective indeterminacy and reduce the fuzziness that characterizes these situations.

REFERENCES

- Aguinis, H., & Solarino, A. M. 2019. Transparency and replicability in qualitative research: The case of interviews with elite informants. *Strategic Management Journal*, 40: 1291–1315
- Argyres, N. S., De Massis, A., Foss, N. J., Frattini, F., Jones, G., & Silverman, B. S. 2020. History-informed strategy research: The promise of history and historical research methods in advancing strategy scholarship. *Strategic Management Journal*, 41: 343–368.
- Austin, R. D., Devin, L., & Sullivan, E. E. 2012. Accidental innovation: Supporting valuable unpredictability in the creative process. *Organization Science*, 23: 1505-1522.
- Bamberger, P. A. 2019. On the replicability of abductive research in management and organizations: Internal replication and its alternatives. *Academy of Management Discoveries*, 5: 103–108.
- Barnett W. P. 2008. *The red queen among organizations: How competitiveness evolves*. Princeton, NJ: Princeton University Press.
- Baum, J. A., Shipilov, A. V., & Rowley, T. J. 2003. Where do small worlds come from? *Industrial and Corporate Change*, 12: 697-725.
- Bogner, W. C., & Barr, P. S. 2000. Making sense in hypercompetitive environments: A cognitive explanation for the persistence of high velocity competition. *Organization Science*, 11: 212-226.
- Bottazzi, G., & Secchi, A. 2003. Common properties and sectoral specificities in the dynamics of US manufacturing companies. *Review of Industrial Organization*, 23: 217-232.
- Bottazzi, G., & Secchi, A. 2006. Explaining the distribution of firm growth rates. *RAND Journal of Economics*, 37: 235-256.
- Burgelman R. A. 1983. A process model of internal corporate venturing in the diversified major firm. *Administrative Science Quarterly*, 28: 223–244.

- Burgelman, R. A. 1994. Fading memories: A process theory of strategic business exit in dynamic environments. *Administrative Science Quarterly*, 39: 24–56.
- Cattani, G. 2006. Technological pre-adaptation, speciation, and emergence of new technologies: How Corning invented and developed fiber optics. *Industrial and Corporate Change*, 15: 285-318.
- Cohen, M. D., March, J. G., & Olsen, J. P. (1972). A garbage can model of organizational choice. *Administrative Science Quarterly*, 17: 1-25.
- Collier, D., & Mahoney, J. 1996. Insights and pitfalls: Selection bias in qualitative research. *World Politics*, 49: 56-91.
- Collins, R. 2017. Emotional dynamics and emotional domination drive the microtrajectory of moments of collective contingency: Comment on Ermakoff. *American Journal of Sociology*, 123: 276-283.
- Corsano, W. A., & Heise, D. R. 1990. Event structure models from ethnographic data. In C. Clogg (Ed.), *Sociological methodology*: 1-57. Cambridge: Basil Blackwell.
- Denrell, J. 2003. Vicarious learning, undersampling of failure, and the myths of management. *Organization Science*, 14: 227-243.
- Denrell, J. 2004. Random walks and sustained competitive advantage. *Management Science*, 50: 922-934.
- Denrell, J. 2005. Should we be impressed with high performance? *Journal of Management Inquiry*, 14: 292-298.
- Denrell, J., Fang, C., & Winter, S. G. 2003. The economics of strategic opportunity. *Strategic Management Journal*, 24: 977-990.

- Denrell, J., Fang, C., & Zhao, Z. 2013. Inferring superior capabilities from sustained superior performance: A Bayesian analysis. *Strategic Management Journal*, 34: 182-196.
- Denrell, J., Fang, C., & Liu, C. 2015. Perspective—Chance explanations in the management sciences. *Organization Science*, 26: 923–940.
- Denrell, J., & Kovács, B. 2008. Selective sampling of empirical settings in organizational studies. *Administrative Science Quarterly*, 53: 109-144.
- Denrell, J., & Shapira, Z. 2008. Performance sampling and bimodal duration dependence. *Journal of Mathematical Sociology*, 33: 38-63.
- Dew, N. 2009. Serendipity in entrepreneurship. *Organization Studies*, 30: 735-753.
- de Rond, M., & Thietart, R. A. 2007. Choice, chance, and inevitability in strategy. *Strategic Management Journal*, 28: 535–551.
- Doz, Y., & Wilson, K. 2018. *Ringtone: Exploring the rise and fall of Nokia in mobile phones*. Oxford: Oxford University Press.
- Eisenhardt, K. M. 1989. Building theories from case study research. *Academy of Management Review*, 14: 532-550.
- Ermakoff, I. 2008. *Ruling oneself out: A theory of collective abdication*. Durham: Duke University Press.
- Ermakoff, I. 2010. Motives and alignments: Response to Kimeldorf's, Adut's, and Hall's comments on Ruling Oneself Out. *Social Science History*, 34: 97-109.
- Ermakoff, I. 2014. Exceptional cases: Epistemic contributions and normative expectations. *European Journal of Sociology*, 55: 223-243.
- Ermakoff, I. 2015. The structure of contingency. *American Journal of Sociology*, 121: 64–125.

- Ermakoff, I. 2019. Causality and history: Modes of causal investigation in historical social sciences. *Annual review of sociology*, vol. 45: 581–606. Palo Alto, CA: Annual Reviews
- Frankish, J. S., Roberts, R. G., Coad, A., Spears, T. C., & Storey, D. J. 2013. Do entrepreneurs really learn? Or do they just tell us that they do? *Industrial and Corporate Change*, 22: 73-106.
- Fisher, G., & Aguinis, H. 2017. Using theory elaboration to make theoretical advancements. *Organizational Research Methods*, 20: 438-464.
- Fitza, M. A. 2014. The use of variance decomposition in the investigation of CEO effects: How large must the CEO effect be to rule out chance? *Strategic Management Journal*, 35: 1839-1852.
- Fitza, M. A. 2017. How much do CEOs really matter? Reaffirming that the CEO effect is mostly due to chance. *Strategic Management Journal*, 38: 802-811.
- Floyd, S., & Lane, P. J. 2000. Strategizing throughout the organization: Managing role conflict in strategic renewal. *Academy of Management Review*, 25: 154-177.
- Godfrey, P. C., Hassard, J., O'Connor, E. S., Rowlinson, M., Ruef, M. 2016. What is organizational history? Toward a synthesis of history and organization studies. *Academy of Management Review*, 41: 590–608.
- Graebner, M. E. 2004. Momentum and serendipity: How acquired leaders create value in the integration of technology firms. *Strategic Management Journal*, 25: 751-777.
- Grant, R. M. 2003. Strategic planning in a turbulent environment: Evidence from the oil majors. *Strategic Management Journal*, 24: 491-517.

- Greve, H. R., & Seidel, M. D. L. 2015. The thin red line between success and failure: Path dependence in the diffusion of innovative production technologies. *Strategic Management Journal*, 36: 475-496.
- Griffin, L. J. 1993. Narrative, event-structure analysis, and causal interpretation in historical sociology. *American Journal of Sociology*, 98: 1094–1133.
- Griffin, L. J., & Korstad, R. R. 1998. Historical inference and event-structure analysis. *International Review of Social History*, 43: 145-165
- Heise, D. R. 1989. Modeling event structures. *Journal of Mathematical Sociology*, 14: 139–169.
- Henderson, A. D., Raynor, M. E., & Ahmed, M. 2012. How long must a firm be great to rule out chance? Benchmarking sustained superior performance without being fooled by randomness. *Strategic Management Journal*, 33: 387-406.
- Hoffman, A. J., & Ocasio, W. 2001. Not all events are attended equally: Toward a middle-range theory of industry attention to external events. *Organization Science*, 12: 414-434.
- Hrebiniak, L. G., & Joyce, W. F. 1985. Organizational adaptation: Strategic choice and environmental determinism. *Administrative Science Quarterly*, 30: 336-349.
- Jarzabkowski, P., Lê, J., & Spee, P. 2017. Taking a strong process approach to analyzing qualitative process data. In A. Langley & H. Tsoukas (Eds.), *The SAGE handbook of process organization studies*: 237–253. London: Sage.
- Kaplan, S. 2008. Framing contests: Strategy making under uncertainty. *Organization Science*, 19: 729-752.
- Ketokivi, M., & Choi, T. 2014. Renaissance of case research as a scientific method. *Journal of Operations Management*, 32: 232-240.

- Kipping, M., & Lamberg, J. A. 2017. History in process organization studies: What, why, and how. In A. Langley & H. Tsoukas (Eds.), *The SAGE handbook of process organization studies*: 303-320. London: Sage.
- Kipping, M., Wadhwani, R. D., & Bucheli, M. 2014. Analyzing and interpreting historical sources: A basic methodology. In M. Bucheli & D. Wadhwani (Eds.). *Organizations in time: History, theory, methods*: 305–329. Oxford: Oxford University Press.
- Korn, H. J., & Baum, J. A. 1999. Chance, imitative, and strategic antecedents to multimarket contact. *Academy of Management Journal*, 42: 171-193.
- Lampel, J., & Shapira, Z. 2001. Judgmental errors, interactive norms, and the difficulty of detecting strategic surprises. *Organization Science*, 12: 599-611.
- Lane, J. N., Ganguli, I., Gaule, P., Guinan, E., & Lakhani, K. R. 2021. Engineering serendipity: When does knowledge sharing lead to knowledge production? *Strategic Management Journal*, 42: 1215-1244.
- Langley, A. 1999. Strategies for theorizing from process data. *Academy of Management Review*, 24: 691–710.
- Langley, A., Smallman, C., Tsoukas, H., & Van de Ven, A. H. 2013. Process studies of change in organization and management: Unveiling temporality, activity, and flow. *Academy of Management Journal*, 56: 1-13.
- Lara-Millán, A., Sargent, B., & Kim, S. 2020. Theorizing with archives: Contingency, mistakes, and plausible alternatives. *Qualitative Sociology*, 43: 345-365.
- Levinthal, D. A. 1991. Random walks and organizational mortality. *Administrative Science Quarterly*, 36: 397-420.

- Levinthal, D. A., & March, J. G. 1993. The myopia of learning. *Strategic Management Journal*, 14: 95-112.
- MacKay, R. B., & Chia, R. 2013. Choice, chance, and unintended consequences in strategic change: A process understanding of the rise and fall of NorthCo Automotive. *Academy of Management Journal*, 56: 208–230.
- Mahoney, J. 2012. The logic of process tracing tests in the social sciences. *Sociological Methods & Research*, 41: 570–597.
- Mosakowski, E. 1997. Strategy making under causal ambiguity: Conceptual issues and empirical evidence. *Organization Science*, 8: 414-442.
- Ocasio, W. 1997. Towards an attention-based view of the firm. *Strategic Management Journal*, 18: 187-206.
- Ollila, J., & Saukkomaa, H. 2013. *Mahdoton menestys*. Helsinki: Otava
- Page, S. E. 2006. Path dependence. *Quarterly Journal of Political Science*, 1: 87-115.
- Pentland, B. T. 1999. Building process theory with narrative: From description to explanation. *Academy of Management Review*, 24: 711–724.
- Pettigrew A. 1985. *Awakening giant: Continuity and change in ICI*. Oxford: Blackwell.
- Pettigrew A. 1987. Context and action in the transformation of the firm. *Journal of Management Studies*, 24: 649-670.
- Pratt, M. G., Kaplan, S., & Whittington, R. 2020. Editorial essay: The tumult over transparency: Decoupling transparency from replication in establishing trustworthy qualitative research. *Administrative Science Quarterly*, 65: 1-19.
- Quigley, T. J., & Graffin, S. D. 2017. Reaffirming the CEO effect is significant and much larger than chance: A comment on Fitza (2014). *Strategic Management Journal*, 38: 793-801.

- Rao, H., & Greve, H. R. 2018. Disasters and community resilience: Spanish flu and the formation of retail cooperatives in Norway. *Academy of Management Journal*, 61: 5-25.
- Sauder, M. (2020). A Sociology of Luck. *Sociological Theory*, 38, 193-216.
- Shipp, A. J., & Cole, M. S. 2015. Time in individual-level organizational studies: What is it, how is it used, and why isn't it exploited more often? *Annual Review of Organizational Psychology and Organizational Behavior*, vol. 2: 237–260. Palo Alto: Annual Reviews.
- Shipp, A. J., & Fried, Y. (Eds.). 2014. **Time and work: How time impacts individuals** (Volume 1). New York: Psychology Press.
- Smith, W. K., & Tushman, M. L. 2005. Managing strategic contradictions: A top management model for managing innovation streams. *Organization Science*, 16: 522-536.
- Sutton, J. 2002. The variance of firm growth rates: The 'scaling' puzzle. *Physica a: Statistical Mechanics and its Applications*, 312: 577-590.
- Teece, D. J. 2007. Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28: 1319–1350.
- Thietart, R. A. 2016. Strategy dynamics: Agency, path dependency, and self-organized emergence. *Strategic Management Journal*, 37: 774–792.
- Winter, S. G. 2012. Purpose and progress in the theory of strategy: Comments on Gavetti. *Organization Science*, 23: 288-297.
- Yin, R. K. 2003. *Case study research: Design and methods* (3rd ed.). Thousand Oaks: Sage

FIGURE 1

Theoretical Framework for the Focal Study

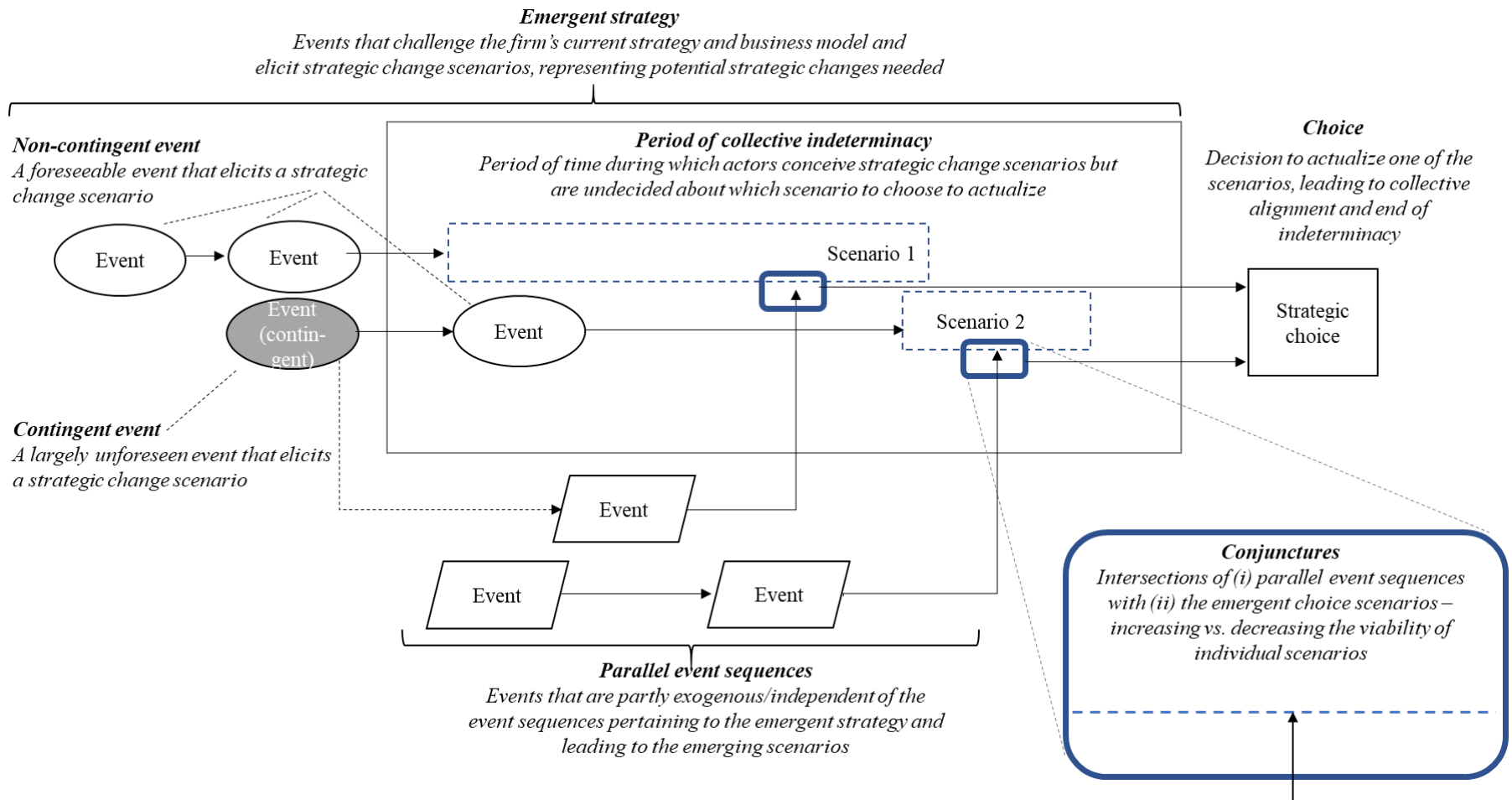
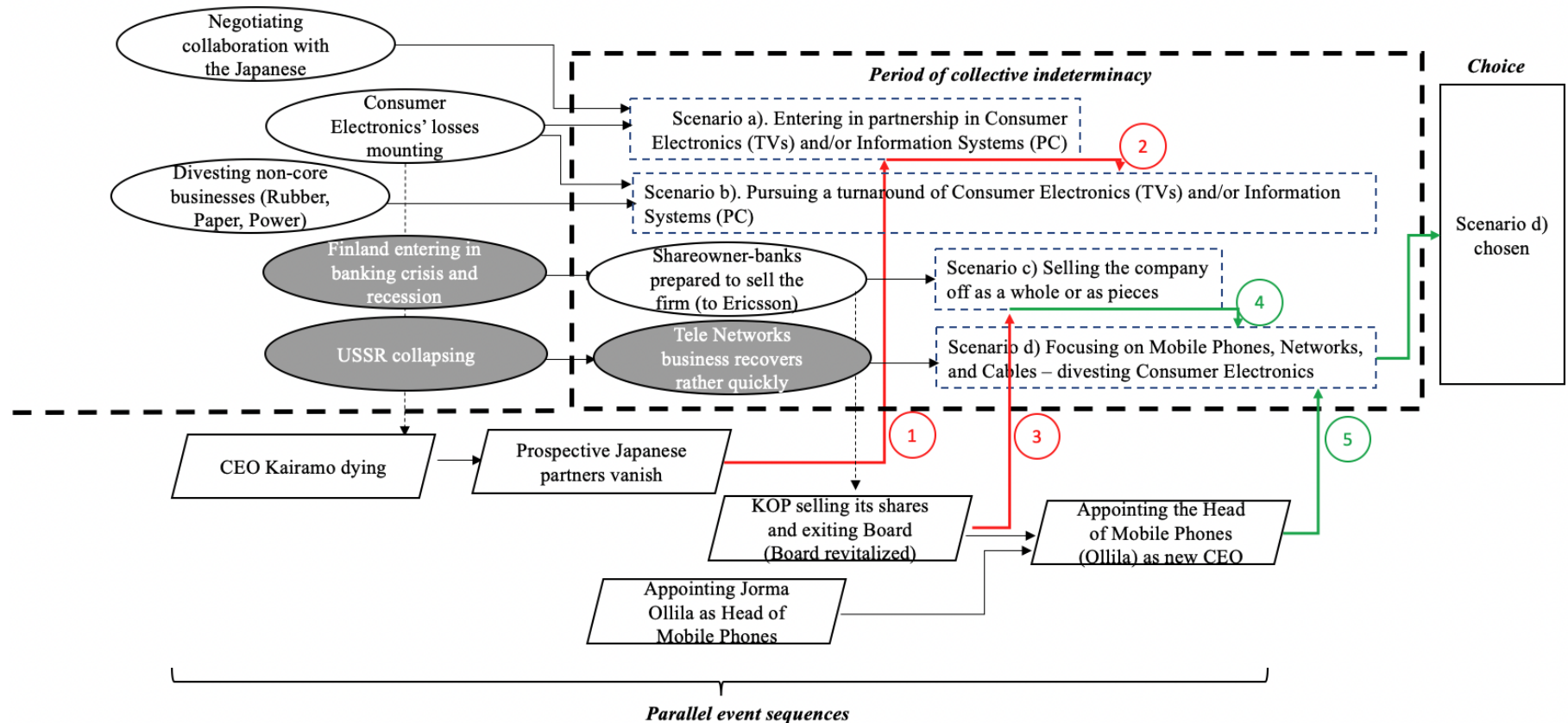


FIGURE 2

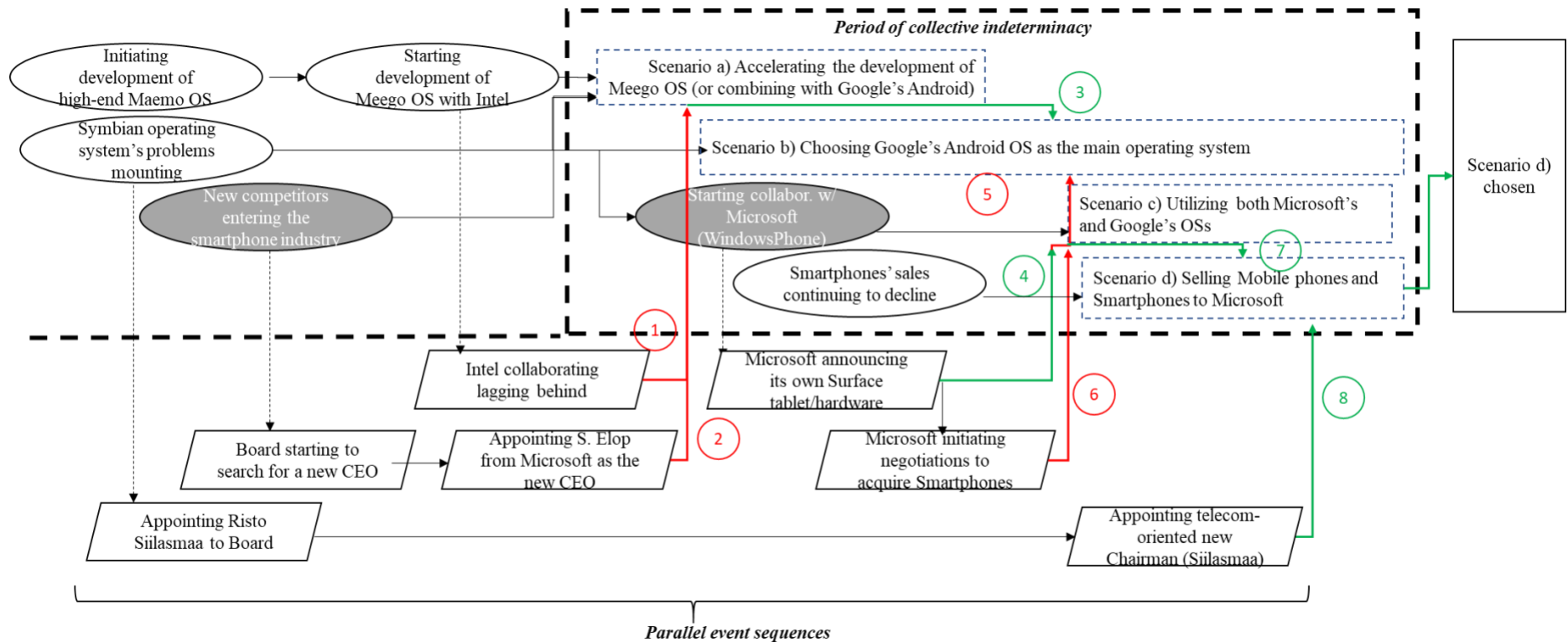
Summary of Key Events at Nokia for the First Period of Collective Indeterminacy (1988-1995)



Notes. The events in gray circles were contingent (largely unforeseeable) individual events, while the events in white circles were non-contingent (somewhat foreseeable) events. The red (/green) arrows indicate that the intersecting event of the parallel event sequence substantially diminished (/reinforced) the viability of the strategic change scenario in question. The circled numbers refer to intersections analyzed in Table 2.

FIGURE 3

Summary of Key Events at Nokia for the Second Period of Collective Indeterminacy (2008-2015)



Notes. The events in gray circles were contingent (largely unforeseeable) individual events, while the events in white circles were non-contingent (somewhat foreseeable) events. The red (/green) arrows indicate that the intersecting event of the parallel event sequence substantially diminished (/reinforced) the viability of the strategic change scenario in question. The circled numbers refer to intersections analyzed in Table 2.

APPENDIX A

Full Event Structure Analyses

FIGURE A1

Event Structure Analysis of Nokia's First Strategic Change Episode

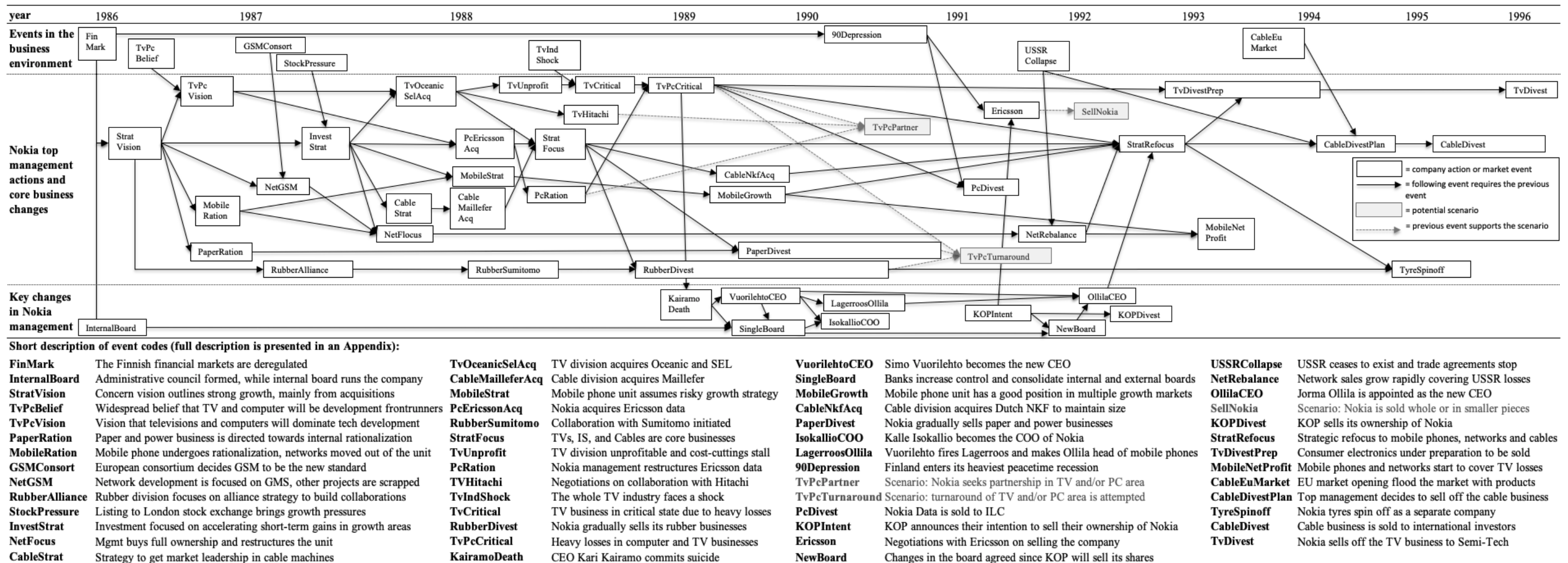
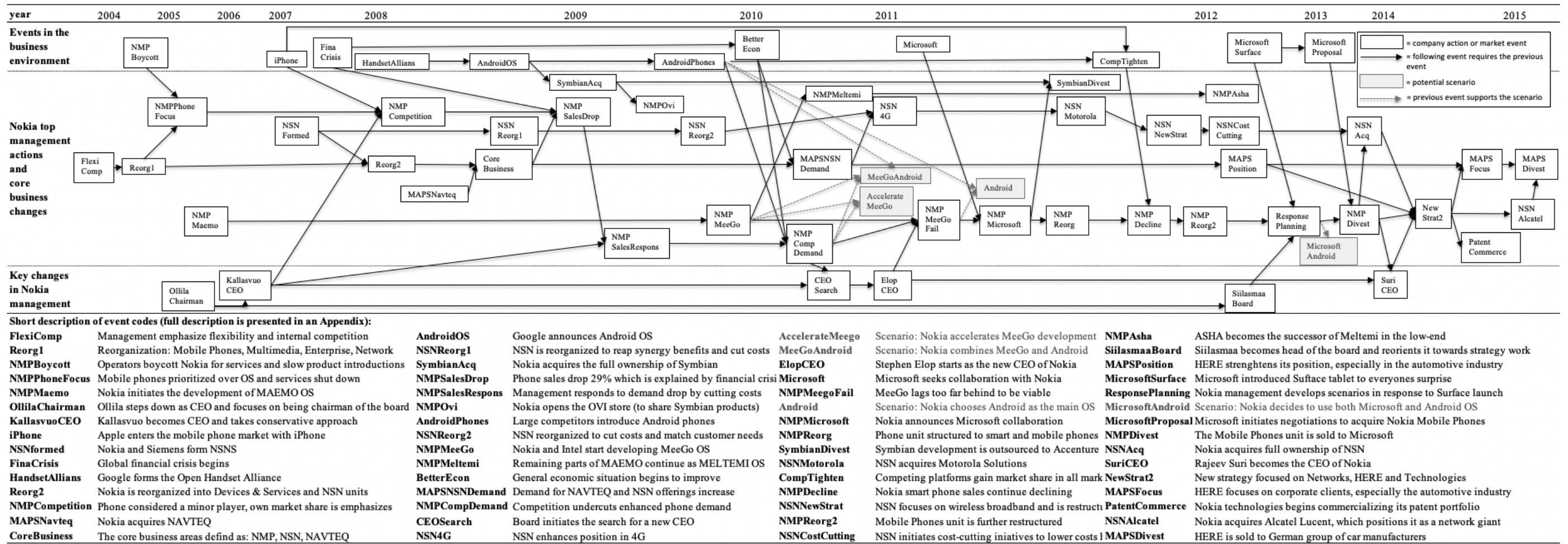


FIGURE A2

Event Structure Analysis of Nokia's Second Strategic Change Episode



APPENDIX B

Event Coding

TABLE B1
Events Coding in Nokia's First Strategic Change Episode

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1983 on-wards		Kuisma & Keskisarja, 2012: 202 Ollila & Saukkomaa, 2013: 113-114	FinMark	The Finnish financial markets are deregulated which enables companies to freely acquire capital from the international financial markets		
1986	Annual Report, 1986	Häikiö, 2012a: 145-148 Ollila & Saukkomaa, 2013: 112	Internal Board	CEO Kari Kairamo achieves a new governance model in which major shareholders form an administrative council and an internal board of directors has decision-making authority in the company		
1986	Program of the 1986 Strategy workshop, Sari Baldauf, 16.12.1986, Nokia Archive.	Häikiö, 2012a: 151-152 Interview with a former member of Nokia's top management team 1	Strat Vision	Top management outlines concern vision until 1990 stating that growth will remain strong in the oncoming years and that it comes mainly from acquisitions	FinMark InternalBoard	Deregulation of financial markets (Finmark) and formation of an internal board (InternalBoard) enabled the top management to concretize their new goals into a concern vision that focused on international growth
1986	Materials from Eureka -95, Hdtv project, 1986, Salora Archive	Häikiö, 2012a: 224-225	TvPc Belief	There is a widespread belief in Europe that TVs and computers will become frontrunners in technology development		

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1987	Memorandum on potential acquisition targets and potential collaborators, Sari Baldauf, 11.5.1987, Nokia Archive	Häikiö, 2012a: 224-225 Interview with a former member of Nokia's top management team 1	TvPc Vision	Top management has a strategic vision that televisions and computers will dominate the development of electronics	StratVision TvPcBelief	Nokia top management translated the broader concern vision (StratVision) and the general belief in TVs and computers (TvPcBelief) into a vision that TVs and computers would be key technologies that Nokia needs to invest in
1986-1988	Strategy process material, Nokia Corporation, 1986-1988, Nokia Archive; Monitor Consulting Group Analysis on Industry Attractiveness, 1988, Nokia Archive	Häikiö, 2012a: 153, 157	Paper Ration	Paper and power business is directed towards internal rationalization with projections of slow growth in existing markets and moderate growth new markets	StratVision	Based on the concern vision (StratVision), traditional business areas such as paper and power were to assume a conservative approach to growth in order to balance riskier business areas
1987	Memorandum, Corporate Planning 1987, Nokia Archive	Interview with a former member of Nokia's top management team 1 Interview with an former member of Nokia's top management team 2	Mobile Ration	Mobile phone division undergoes rationalization and change in management, while network base stations and private mobile radios are moved out of the unit	StratVision	These actions followed the broader concern vision for growth in different areas of electronics (StratVision) and led to the separation of handset and network development
1987		Häikiö, 2012a: 188-190 GSMA History Interview with a former member of Nokia's top management team	GSM consort	European consortium decides that GSM will be the new mobile phone network standard		

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1987	Annex to Nokia Mobira board of directors meeting memo 4.10.1987	Häikiö, 2012a: 188 Interview with a former member of Nokia's top management team 2 GSMA History	NetGSM	Network unit focused on the development of a GSM network with goal of launching first GSM network in Europe on 1.7.1991, while scrapping other network development projects	GSMconsort StratVision	For the network business, it was crucial to focus on a leading network standard (GSMconsort) and develop a network rapidly in order to instigate growth (StratVision). This was also successful since the first GSM call was ultimately made in Finland
1986-1988	Memorandums attached to Board meeting minutes, 1987/3/3 and 1987/5/7, Nokia Archive'	Aunesluoma (in Häikiö, 2012a): 204	Rubber Alliance	After few minor acquisitions the Rubber division focuses on alliance strategy to build collaboration with other industry actors	StratVision	Based on the concern vision (StratVision), the rubber division was planned to grow through alliances
1987-1988	Strategy Memorandum, Kari Kairamo, 1.2.1988, Nokia Archive	Häikiö, 2012a: 232 Ollila & Saukkomaa, 2013: 121	Stock Pressure	As a consequence of listing to the London Stock Exchange, pressure to grow and financial position are strong		
1987	Memorandum, Approved Acquisitions 1987, Nokia Archive	Saari, 2000	InvestStrat	Investment strategy is focused on changing the concern structure and accelerating short-term gains in growth areas. Investments in slow growth areas are to be minimized	StratVision StockPressure	The investment strategy further concretized how the concern vision was to be put into action (StratVision) and how Nokia could redeem the expectations set on them after listing in the London Stock Exchange with a strong financial position (StockPressure)

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1987	Annex to Nokia Mobira board of directors meeting memo 4.10.1987	Häikiö, 2012a: 190-194, 232	NetFocus	Nokia buys Finnish state out of the network business and moves network base stations to the unit	MobileRation InvestStrat NetGSM	Following previous efforts to rationalize the telecom business (MobileRation), strategy to grow rapidly in electronics through investments (InvestStrat) and focus on GSM networks (NetGSM), this move enabled Nokia to separate the development of networks and handsets into different units that could operate on their own
1987		Häikiö, 2012a: 107	CableStrat	Strategy of the cable unit is to acquire undisputed market leadership in cable machines	InvestStrat	Following the investment strategy (InvestStrat), the goal of the cable unit was to grow through acquisitions and by increasing capacity
1987	Situation analysis by Consumer Electronics Manager Matti Paasila to COO Vuorilehto, Nov/Dec 1989, Nokia Archive	Häikiö, 2012a: 230-233 Interview with a former member of Nokia's board of directors 1 Interview with an former member of Nokia's top management team 1 Ollila & Saukkomaa, 2013: 132-133	TvOceanic SelAcq	Consumer electronics division acquires the French Oceanic TV producer and German Standard Elektrik Lorenz (SEL)	TvPcVision InvestStrat	The rationale for acquiring Oceanic and SEL followed from the belief that TVs/consumer electronics were a key technology that Nokia needed to focus on (TvPcVision) and from the investment strategy that emphasized the need for investing in growth areas to redeem expectations (InvestStrat). This move made Nokia the third largest TV producer in Europe

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1987	Annual Report, 1987	Häikiö, 2012a: 106-108	Cable Maillefer Acq	Cable division acquires the Swiss cable machinery manufacturer Maillefer that makes it a market leader in cable machinery business	CableStrat	The acquisition of Maillefer enabled the cable unit to fulfill their goal of attaining market leadership (CableStrat) by acquiring their main competitor
1987-1988	Annex to Nokia Mobira board of directors meeting memo 4.10.1987 Strategic work in the top management 1988 document	Häikiö, 2012a: 139 Interview with a former Nokia-Mobira manager	Mobile Strat	Mobile phone division assumes a high-risk growth strategy and the area is perceived to be a new spearhead business	MobileRation InvestStrat	The new strategy sprung from previous reorganization of the business area (MobileRation) and the possibility to seek growth through investments when the company's financial position was strong (InvestStrat)
1988	Situation analysis by Board Member Koski to the Board, August 1986, Nokia Archive	Häikiö, 2012a: 234, 263-264 Interview with a former member of Nokia's board of directors 1 Interview with a former member of Nokia's top management team 1 Ollila & Saukkomaa, 2013: 134	PcEricsson Acq	Nokia acquires Ericsson data	InvestStrat TvPcVision	The acquisition of Ericsson data enabled Nokia to become the largest computer company in the Nordics which followed the strategy to grow in key business areas through acquisitions (InvestStrat) and followed the belief that computers were a key business area of the future (TvPcVision)
1987		Häikiö, 2012a: 204, 211-212	Rubber Sumitomo	Rubber group initiates collaboration with Sumitomo to focus on winter and specialized tires	Rubber Alliance	This move actualized the previous plan to grow through alliances (RubberAlliance)

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1987	Internal strategy document, ranking of business units according to BCG matrix, 1987, Nokia Archive	Häikiö, 2012a: 232 Interview with a former member of Nokia's top management team 1 Ollila & Saukkomaa, 2013, p. 132	StratFocus	With the investments in TVs/consumer electronics, computers and cables, top management frames these as the most important core businesses of the firm	TvOceanicSelAcq PcEricssonAcq CableMailleferAcq	CEO Kari Kairamo had a vision that future growth lay in the combination of consumer electronics, computers and telecommunications. This was realized by acquisitions in these three areas (TvOceanicSelAcq, PcEricssonAcq, CableMailleferAcq) and foreshadowed divestments in the more traditional business areas
1988	CEO Kairamo's personal letter to COO Vuorilehto, September/October 1988, Nokia Archive	Häikiö, 2012a: 248-249, 258-259, 267, 301 Interview with a former member of Nokia's top management team Ollila & Saukkomaa, 2013: 138-139	TvUnprofit	The unprofitable Consumer Electronics business is further hampered by constant management changes and the scrapping of cost-cutting initiatives that had been planned immediately after the acquisitions	TvOceanicSelAcq	Antti Lagerroos who initially pushed for the acquisitions (TvOceanicSelAcq) failed to implement rationalization and he was moved aside when Jacques Noels was appointed as the new head of the business area. This stopped the rationalization process initiated by Lagerroos, while Noels failed to implement his own rationalization program.
1988	NET 3/88, 'Nokia Dataa muodostetaan', Nokia Archive	Häikiö, 2012a: 263-264	PcRation	Nokia management restructures Ericsson data	PcEricssonAcq	Kalle Isokallio led the restructuring of the newly acquired Ericsson data (PcEricssonAcq) where rationalization efforts had begun already before the acquisition due to poor performance. Simultaneously negotiations about partnership were made with Honeywell, Olivetti and ILC.

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1988		Häikiö, 2012a: 265, 271 Interview with a former member of Nokia's top management team 1	TVHitachi	Negotiations regarding collaboration in Tv business area are ongoing with Hitachi	TvOceanicSelAcq	Timo Koski and Antti Lagerroos negotiated with Hitachi about a joint company that would be based on Nokia's new TV production in Germany (TvOceanicSelAcq). Negotiations were also initiated with Phillips, Sanyo and Thompson.
1988		Häikiö, 2012a: 265 Ollila & Saukkomaa, 2013: 138-139	TvInd Shock	The whole TV industry is in trouble and big operators rationalize production by moving it to Asia		
1988		Häikiö, 2012a: 266 Interview with an former member of Nokia's board of directors 1 Ollila & Saukkomaa, 2013: 139-140	TvCritical	Top management realizes that the situation with TVs/consumer electronics is critical since it is making heavy losses	TvUnprofit TvIndShock	While the TV business constituted 30% of Nokia's turnover, it was making heavy losses since the rationalization programs had little effect (TvUnprofit) and the European TV industry as a whole was in trouble (TvIndShock)
1989-1995	Annual Reports 1988 and 1989	Häikiö, 2012b: 96-97	Rubber Divest	Nokia gradually sells majority of its rubber businesses because they are considered non-essential, retaining only tires	Rubber Sumitomo StratFocus	Following the company's new strategic focus (StratFocus), Nokia gradually sells its rubber businesses during 1988-1990 and retains only the tyre business (RubberSumitomo)

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1988		Häikiö, 2012a: 273 Interview with a former member of Nokia's top management team 1	TvPc Critical	Top management presents to the board of directors numbers that indicate heavy losses in computers and TVs/consumer electronics	PcRation TvCritical	The poor performance in the computer (PcRation) and consumers electronic (TvCritical) areas mounted during the fall of 1988 and the failure in these business areas was revealed to the board of directors in December 1988
1988		Häikiö, 2012a: 274 Interview with a former member of Nokia's board of directors 1 Interview with a former member of Nokia's top management team Ollila & Saukkomaa, 2013: 144	Kairamo Death	CEO Kari Kairamo commits suicide	TvPcCritical	The critical state of computer and TVs/consumer electronics businesses (TvPcCritical) contributed to Kari Kairamo's decision to commit suicide
1988	Annual Report, 1988	Häikiö, 2012a: 286 Interview with a former member of Nokia's top management team 1 Ollila & Saukkomaa, 2013: 147	Vuorilehto CEO	Simo Vuorilehto becomes the new CEO after the death of Kairamo	KairamoDeath	The death of CEO Kari Kairamo (KairamoDeath) leads Simo Vuorilehto to become the new CEO since he was the next in line for the position

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1989		Häikiö, 2012a: 287 Interview with a former member of Nokia's top management team Ollila & Saukkomaa, 2013: 153	Single Board	Banks, that were major shareholders, increased their control of the company and the internal and external boards were consolidated	InternalBoard Vuorilehto CEO KairamoDeath	As a consequence of the change in CEO (VuorilehtoCEO) and power vacuum left by the death of the CEO Kari Kairamo (KairamoDeath), the internal and external boards (InternalBoard) are consolidated in order to simplify management and give major shareholders more control of the company
1989	Nokia-Mobira market analysis 3.1.1989; Mobile phone market analysis in France 24.5.1989; Nokia Cellular Systems Strategy 1988-1991, 5.10.1988, Nokia Archive	Häikiö, 2012b: 16-18 Interview with a former Nokia-Mobira manager	Mobile Growth	Mobile phone unit has good position in multiple key markets and those markets are growing	MobileStrat	The previously assumed high-risk growth strategy paid off (MobileStrat) and Nokia had been able to grow in key markets. Simultaneously, the expected annual market growth in key markets ranged between 30% and 100%.
1989	Annual Report, 1989	Häikiö, 2012a: 221	CableNkf Acq	Cable division acquires Dutch NKF to maintain large enough size in cable manufacturing to stay competitive	StratFocus	This move further solidified the top managers perception that TVs/consumer electronics, computers and cables were the core business of Nokia (StratFocus) since it enabled maintaining large enough size to stay competitive

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1990	Annual Report, 1990	Häikiö, 2012a: 202-203 Häikiö, 2012b: 98-101 Interview with a former member of Nokia's top management team 1 Ollila & Saukkomaa, 2013: 126-130	Paper Divest	Nokia gradually sells paper and power businesses because they weren't anymore core business	StratFocus PaperRation	Jorma Ollila managed the divestment process which followed the rationale that paper was not a core business (StratFocus) and it was not large enough to be competitive in the European paper market (PaperRation)
1990	Annual Report, 1990	Häikiö, 2012a: 293 Interview with a former member of Nokia's top management team Ollila & Saukkomaa, 2013: 153	Isokallio COO	Kalle Isokallio becomes the new COO of Nokia which is backed by the CEO Vuorilehto and the board of directors	Vuorilehto CEO SingleBoard	The new CEO Vuorilehto drove this change (VuorilehtoCEO) which was eventually supported by the new board (SingleBoard). Vuorilehto drove this change because he did not trust Antti Lagerroos that he considered to be a dissident
1990		Häikiö, 2012a: 293 Häikiö, 2012b: 18 Interview with a former member of Nokia's top management team 1 Interview with an former member of Nokia's top management team 2 Ollila & Saukkomaa, 2013: 153	Lagerroos Ollila	CEO Vuorilehto conveys the board to fire Antti Lagerroos and replaces him with Jorma Ollila as the head of the mobile phone business area	Vuorilehto CEO	CEO Vuorilehto and Antti Lagerroos did not get along very well and as a consequence Vuorilehto used his position (VuorilehtoCEO) to fire Lagerroos and move Jorma Ollila to become the head of mobile phones
1991		Kuusterä and Tarkka, 2011	90 Depression	Finland enters its the heaviest peacetime recession	FinMark	The depression of the 90s is partly a result of the liberalization of the Finnish financial markets in mid 80s (FinMark).

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1988		Häikiö, 2012a: 258, 263-264 Interview with a former member of Nokia's top management team 1	TvPc Partner	Scenario in which Nokia seeks partnership in TVs/Consumer Electronics and Information Systems to strengthen the businesses	TvPcCritical TVHitachi PcRation	This scenario is supported by the information that both of these business areas were in a critical condition (TvPcCritical) and to rectify the situation Nokia had already negotiated with Hitachi, Phillips, Sanyo, and Thompson about a partnership in the Tv/consumer electronics area (TVHitachi). In the computer business area, Nokia had also negotiated with Honeywell, Olivetti, and ILC about a partnership (PcRation)
1988-1992	Nokia Home Electronics Strategic Plan 1992, 17.8.1992, Nokia Archive	Häikiö, 2012a: 290-291, 298-299	TvPcTurn around	Scenario in which Nokia divest non-core businesses to free up resources for a turnaround of TVs/Consumer Electronics and Information Systems businesses	TvPcCritical RubberDivest PaperDivest	This scenario is supported by the information that both of these business areas were in a critical condition (TvPcCritical) and the divestment of rubber and paper businesses (RubberDivest, PaperDivest) already gave Nokia capital that could have been used to attempt a turnaround
1991	Credit Suisse Equity Research Report, 1991, Nokia Archive	Häikiö, 2012a: 302-303 Ollila & Saukkomaa, 2013: 216	PcDivest	Nokia Data is sold to ILC	TvPcCritical 90Depression	The poor performance of computer and consumers electronics areas (TvPcCritical) in combination with an economic depression in the home market (90Depression) led Nokia to sell the computer business to ILC

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1991		Häikiö, 2012a: 295 Häikiö, 2012b: 28-30 Interview with a former member of Nokia's board of directors 1	KOPIntent	KOP (one of the main shareholders) announces their intention to sell their shares of Nokia		
1991		Häikiö, 2012b: 28-35 Interview with a former member of Nokia's board of directors 1 Ollila & Saukkomaa, 2013: 11, 187	Ericsson	Nokia management negotiates with Ericsson about selling the company	90Depression KOPIntent	Due to the poor economic situation (90Depression), Nokia's key owners began to negotiate with Ericsson about selling the company to them which was initially set in motion by the intention of KOP to sell their shares of Nokia (KOPIntent)
1992		Häikiö, 2012b: 40-41 Interview with a former member of Nokia's board of directors 1 Interview with a former member of Nokia's board of directors 2	NewBoard	Changes in the board composition are agreed since KOP (one of the major shareholders) will sell their share of Nokia	KOPIntent SingleBoard	The intention of KOP to sell their shares of Nokia (KOPIntent) directly influenced the composition of the board of directors (SingleBoard) and enables charting new directions for the company
1991		Häikiö, 2012a: 285 Häikiö, 2012b: 23 Interview with a former member of Nokia's top management team 1	USSR Collapse	USSR ceases to exist and revenues from there comes to a standstill due to scrapping of existing trade deals		
1991		Häikiö, 2012b: 25 Interview with a former member of Nokia's top management team 2 Ollila & Saukkomaa 2013: 227	Net Rebalance	While sales to USSR plummet, sales to other markets grows rapidly offsetting losses from the USSR sales	NetFocus USSRCollapse	Focused development work in the network area (NetFocus) helped to offset losses incurred by the collapse of USSR (USSRCollapse)

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1992	Annual Report, 1992; Nokia Visiopäivä Material, 19.3.1992	Häikiö, 2012b: 40-43 Interview with an former member of Nokia's board of directors 1 Interview with an former member of Nokia's board of directors 2 Interview with an former member of Nokia's top management team 2 Ollila & Saukkomaa, 2013: 10, 184	OllilaCEO	Jorma Ollila is appointed as the new CEO of Nokia	NewBoard Vuorilehto CEO Lagerroos Ollila	Changes in the board (NewBoard), the willingness of CEO Vuorilehto to retire (VuorilehtoCEO), and Jorma Ollila's success in running the mobile phone business (LagerroosOllila) led to his appointment as the new CEO
1991		Häikiö, 2012b: 28-35 Interview with a former member of Nokia's board of directors 1 Ollila & Saukkomaa, 2013: 11, 187, 193	SellNokia	Scenario in which Nokia is sold either as a whole or in smaller pieces	Ericsson	This scenario is supported by that information that negotiations with Ericsson about selling Nokia (Ericsson) went on to the final stretch but were not concluded
1992		Häikiö, 2012b: 41-43 Interview with a former member of Nokia's board of directors 1	KOPDivest	KOP (one of the main shareholders) sells its shares of Nokia	KOPIntent	This action realized the previous intention of KOP to relinquish their ownership of Nokia (KOPIntent) by selling their shares first to Yhdyspankki that then sold the shares back to Nokia

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1991	Nokia Telecommunications Vision 1999, 19.3.1991, Nokia Archive	Häikiö, 2012b: 49-50, 58-60 Interview with a former member of Nokia's board of directors 1 Interview with a former member of Nokia's top management team Interview with a former member of Nokia's top management team 2 Ollila & Saukkomaa, 2013: 184, 190	Strat Refocus	Strategic focus shifts to mobile phones, networks and cables, while other business areas are to be divested	StratFocus TvPcCritical CableNkfAcq MobileGrowth NetRebalance OllilaCEO	Following the failed strategic focus on computers and consumer electronics (StratFocus, TvPcCritical), the new CEO Jorma Ollila (OllilaCEO) outlines that Nokia should orient itself towards becoming a telecom company by focusing on the successful cable (CableNkfAcq), mobile phone (MobileGrowth), and network (NetRebalance) business areas. The initial plan was developed by Ollila during his time as the head of the mobile phone business area and concretized with Olli-Pekka Kallasvuo when he was appointed as the new CEO
1992	Nokia Visiöpäivä Material, 19.3.1992	Häikiö, 2012b: 114-115 Interview with a former member of Nokia's top management team 1 Ollila & Saukkomaa, 2013: 191	TvDivest Prep	TV/consumer electronic business is being restructured and prepared to be sold	StratRefocus TvPcCritical	Following the new strategic focus (StratRefocus) and poor state of the TV/consumer electronics business (TvPcCritical), top management considered that this business area should be either sold directly or merged with another producer that would enable divestment in the future

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1991	Credit Suisse Equity Research Report, 1991, Nokia Archive	Häikiö, 2012b: 62-65 Ollila & Saukkomaa, 2013: 222	Mobile NetProfit	Mobile phones and networks are so profitable that they cover the heavy losses from TV/consumer electronics business	MobileGrowth NetRebalance	Ongoing growth of the mobile phone business (MobileGrowth) and newfangled growth in network markets (NetRebalance) helped balance losses
1993		Häikiö, 2012b: 106	CableEu Market	EU markets open cable business area and the market becomes overflowed with products		
1994-1996		Häikiö, 2012b: 103 Interview with a former member of Nokia's top management team 2 Ollila & Saukkomaa, 2013: 191, 235	Cable DivestPlan	Top management decides to sell off the cable business area due to market changes and its non-essential nature	StratRefocus CableEu Market USSRCollapse	As a consequence of the strategic refocus that made networks and mobile phones the core business (StratRefocus), in combination with the waning cable market in EU (CableEuMarket) and the collapse of USSR (USSRCollapse), the top management decided to sell of the cable business
1995	Annual Report 1995	Häikiö, 2012b: 96 Interview with a former member of Nokia's top management team 1 Ollila & Saukkomaa, 2013: 190-192, 236	Tyre Spinoff	Nokian Tyres spin off as a separate stock-exchange listed company	StratRefocus RubberDivest	Following the new strategic focus (StratRefocus) and previous divestments in the rubber business are (RubberDivest), the tyre business was considered to be non-essential and was therefore spun out as a separate company in 1995

TABLE B1
Continued

Year	In situ data	Retrospective data	ETHNO code	Event description	Prerequisite events	Logic of prerequisite events
1995	Annual Report 1995	Häikiö, 2012b: 103 Ollila & Saukkomaa, 2013: 236	Cable Divest	Cable business is sold to international investors	Cable DivestPlan	The plan to divest the cable business was put into action in 1995-1996 (CableDivestPlan)
1996	Annual Report 1996	Häikiö, 2012b: 125 Ollila & Saukkomaa, 2013: 240-241	TvDivest	Nokia sells off the TV/consumer electronics business to Semi-Tech	StratRefocus TvDivestPrep	Following the attempts to sell the TV/consumer electronics business (TvDivestPrep), it was finally sold to Semi-Tech in 1996

Notes. The Nokia Archive is located in two different places, and does not follow standardized archiving systems.

Accordingly, it is very difficult to use which results in high variation in the finding of materials. To follow an established practice in historical research, we triangulated our findings and interpretations by relying on Häikiö (2012 a and b), the official history of Nokia and interviews we had collected. Häikiö had a full access to Nokia archives plus several personal archives we were not able to use. Accordingly, we rely on archival material when possible (testing their accuracy with Häikiö and the interviews) yet we also use Häikiö when data is not available.

TABLE B2
Events Coding in Nokia's Second Strategic Change Episode

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
		Interview with a former Nokia R&D director Interview with a mobile technology expert Doz & Kosonen, 2010 Lamberg et al., 2019: 16-17 Ollila & Saukkomaa, 2013: 344-347	Flexi Comp	Nokia management emphasized flexibility and internal competition as an antecedent to external competitiveness		
2004	Nokia annual report 2003: 5 Nokia annual report 2004: 5	Interview with a former Nokia project manager Interview with a former Nokia R&D director Interview with a former Nokia VP Lamberg et al., 2019: 21 Ollila & Saukkomaa, 2013: 380-381	Reorg1	Nokia is reorganized into four business units that better match its strategy. These are: Mobile Phones, Multimedia, Enterprise Solutions, and Networks	FlexiComp	Following the emphasis of flexibility and internal competition (FlexiComp), Nokia is organized into four business units
2004	TIVI news 17.9.2004	Interview with a former Nokia project manager Doz & Wilson, 2018: 1 Ollila & Saukkomaa, 2013: 359, 366-368	NMP Boycott	Major telecom operators boycott Nokia in retaliation to its attempts of moving to value-added services and failure to introduce new mobile phones fast enough		
2004	TIVI news 17.9.2004	Interview with a mobile technology expert Interview with a former Nokia R&D director Interview with a Symbian contractor Doz & Wilson, 2018: 90	NMP Phone Focus	Nokia management prioritizes mobile phones over OS development and shut down service development	NMP Boycott Reorg1	Following the boycott from major telecom operators (NMPBoycott) and reorganization (Reorg1), Nokia's top management prioritized the development of mobile phones over the development of operating systems, while shutting down service development

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2005		Interview with a former Nokia contractor Interview with a Nokia contractor Interview with a former mobile software contractor for Nokia Interview with a former Nokia R&D director Interview with a former Nokia VP Doz & Wilson, 2018: 117 Lamberg et al., 2019: 10 Nykänen & Salminen, 2014: 62	NMP Maemo	Nokia initiates the development of MAEMO operating system for high-end mobile phones		
2005	Nokia annual report 2005: 5	Interview with a former NSN director Interview with a former Nokia product manager Lamberg et al., 2019: 17, 19-20	Ollila Chairman	Jorma Ollila steps down as CEO and focuses on being the chairman of Nokia's board		
2005	Nokia annual report 2005: 5	Interview with a former NSN director Interview with a former Nokia product manager Interview with a former Nokia project manager Interview with a former Nokia R&D director Interview with a Nokia contractor Interview with a former Nokia VP Lamberg et al., 2019: 17, 19-20 Ollila & Saukkomaa, 2013: 324	Kallasvuo CEO	Olli-Pekka Kallasvuo becomes the new CEO and he takes a conservative approach to the launch of new products that counter competition with an intent to please investors	Ollila Chairman	As Jorma Ollila steps down as the CEO and becomes the chairman of the board (OllilaChairman), Olli-Pekka Kallasvuo becomes the new CEO of Nokia

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2007	Apple press release, 9.1.2007	Interview with a former Nokia contractor Interview with a former Nokia VP Interview with a mobile technology expert Interview with a Nokia contractor Interview with a former NSN director Lamberg et al., 2019: 5 Siilasmaa & Fredman 2018: 9	iPhone	Apple enters the mobile phone market with iPhone		
2007	Nokia annual report 2007: 4	Interview with a former NSN director Ollila & Saukkomaa, 2013: 398 Siilasmaa & Fredman, 2018: 27-28	NSN formed	Nokia Siemens Networks is formed - partly because required investments into 3G and 4G technologies exceed the funds of both companies		
2007	Wall Street Journal 9.8.2007		FinaCrisis	Global financial crisis begins		
2007	Open handset Alliance press release, 5.11.2007	Lamberg et al., 2019: 5	Handset Allians	Google forms the Open Handset Alliance with a goal to develop mobile phone standards and to launch the Android operating system		
2008	Nokia annual report 2007: 3, 19 Nokia annual report 2008: 3	Interview with a former Nokia product manager Interview with a former Nokia R&D director Interview with a former Nokia strategist Interview with a former Nokia VP	Reorg2	Nokia merges Mobile phones, Multimedia and Enterprise solutions units into a Devices & Service group that will constitute the other main business group in combination with Nokia Siemens Networks	Reorg1 NSNformed	Following the previous reorganization (Reorg1) and the formation of NSN (NSNFormed), Nokia is further reorganized into two main business units: Devices & Services and Nokia Siemens Networks

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2008	Reuters News 21.1.2007	Interview with a former NSN director Interview with a Nokia contractor Interview with a former Nokia product manager Interview with a former Nokia project manager Interview with a former Nokia R&D director Interview with a former Nokia strategist Interview with a former Nokia VP Interview with a mobile technology expert Lamberg et al., 2019: 1 Siilasmaa & Fredman, 2018: 29-32	NMP Competition	Nokia management considers Apple to be a minor player and emphasizes its market share advantage against other competitors	iPhone NMPPhone Focus	Following the introduction of iPhone (iPhone) and Nokia's strong focus in the development of mobile phones (NMPPhoneFocus), the top management considered Apple to be a minor player which was also publicly voiced out by Anssi Vanjoki. Against other competitors, Nokia emphasized its market share advantage
2008	Nokia annual report 2009: 3 Nokia press release, 10.7.2008 European Commission decision 2.7.2008	Ollila & Saukkomaa, 2013: 413	MAPS Navteq	Nokia acquires NAVTEQ		
2008	Nokia annual report 2008: 3		Core Business	The three new core business areas of Nokia are Devices & Services, Nokia Siemens Networks and NAVTEQ	Reorg2 MAPS Navteq	Following the previous reorganization (Reorg2) and the acquisition of NAVTEQ (MAPSNavteq), Nokia's core business areas were defined as being Devices & Services, Nokia Siemens Networks, and NAVTEQ
2008	Android developers blog 23.9.2008	Lamberg et al., 2019: 13 Siilasmaa & Fredman, 2018: 9	Android OS	Google announces Android OS	Handset Allians	

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2008	Nokia annual report 2008: 4		NSN Reorg1	Nokia Siemens Networks is reorganized to reap synergy benefits and cut costs	NSNformed	Following the formation of NSN (NSNFormed), the new company is reorganized in order to increase efficiency
2008	Nokia annual report 2008: 4 Nokia Corporation press release, 2.12.2008	Interview with a former NSN director Interview with a former Nokia contractor Interview with a former mobile software contractor for Nokia Interview with a former Nokia product manager Interview with a former Nokia strategist Interview with a former Nokia VP Interview with a mobile technology expert Interview with a Symbian contractor Lamberg et al., 2019: 6 Nykänen & Salminen, 2014: 61 Ollila & Saukkomaa, 2013: 412 Siilasmaa & Fredman, 2018: 33	Symbian Acq	Nokia acquires the full ownership of Symbian in order to transform it into an open sources software and transfer its ownership to a foundation	AndroidOS	To combat the development of Android OS (AndroidOS), Nokia acquires the full ownership of Symbian in order to transform it into an open sources software

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2008	Nokia annual report 2008: 3	Interview with a former Nokia product manager Nykänen & Salminen, 2014: 17 Siilasmaa & Fredman, 2018: 43	NMPSalesDrop	Sales of the Devices & Services unit is 29% behind target which is explained by management as resulting from the financial crisis	FinaCrisis NMP Competition Core Business	The new Devices & Services unit (CoreBusiness), that includes all mobile phones and services, is 29% behind its sales target which is explained by the financial crisis (FinaCrisis) and by the fact that Nokia was market share leader (NMPCompetition) and was therefore hit hardest by the recession
2009	Nokia annual report 2009: 3	Interview with a former NSN director Siilasmaa & Fredman, 2018: 43-45	NMPSalesRespons	Management responds to the demand drop in mobile phones by cutting costs	NMPSales Drop KallasvuoCEO	Following the drop in sales (NMPSalesDrop), CEO Olli-Pekka Kallasvuo (KallasvuoCEO) initiated short- and long-term cost savings initiatives to rectify the situation
2009	Nokia annual report 2009: 4	Interview with a mobile technology expert Interview with a former Nokia contractor Lamberg et al., 2019: 30 Nykänen & Salminen, 2014: 64	NMPOvi	Nokia opens the OVI store (to share Symbian products)	SymbianAcq	To sell Symbian based services (SymbianAcq), Nokia opens OVI store to sell them

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2009		Interview with a former mobile software contractor for Nokia Lamberg et al., 2019: 30 Nykänen & Salminen, 2014: 62 Siilasmaa & Fredman, 2018: 63	Android Phones	Large mobile phone competitors (including Samsung, LG, HTC, Motorola, Huawei) introduce Android OS phones	AndroidOS	Mobile phones using the Android OS (AndroidOS) enter the markets and Samsung starts to become a dominant company using Android OS
2009	Nokia annual report 2009: 5	Siilasmaa & Fredman, 2018: 64-65	NSN Reorg2	Nokia Siemens Networks reorganizes business units to better match customer needs, cut costs, and lay off 5-7% of the staff by 2011	NSNReorg1	Following previous reorganization (NSNReorg1), Nokia Siemens Networks is further restructured in order to better meet customer needs and cut costs
2010	Nokia annual report 2010: 7	Interview with a former Nokia contractor Interview with a former mobile software contractor for Nokia Interview with a former Nokia product manager Interview with a former Nokia project manager Interview with a former Nokia R&D director Lamberg et al., 2019: 6, 15 Nykänen & Salminen, 2014: 42, 63 Siilasmaa & Fredman, 2018: 72-73	NMP MeeGo	Nokia and Intel announce plans to build software platform MeeGo for high-end mobile phones by combining MAEMO and Moblin	NMPMaemo	The development of MeeGo operating system built on the previous MAEMO project (NMPMaemo) was targeted to become the high-end operating system for Nokia phones

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2010		Interview with a former Nokia project manager Lamberg et al., 2019: 15 Nykänen & Salminen, 2014: 167-168	NMP Meltemi	Remaining parts of MAEMO continues as a separate MELTEMI OS which is targeted to low-end mobile phones	NMPMeeGo	As an offshoot of initiating the development of MeeGo (NMPMeeGo), the remaining parts of MAEMO continues as Meltemi OS project
2010		Siilasmaa & Fredman, 2018: 72	Better Econ	General economic situation begins to improve	FinaCrisis	The effects of the global financial crisis (FinaCrisis) have started to subside and general economic situation has begun to improve
2010	Nokia annual report 2010: 3	Lamberg et al., 2019: 6	MAPS NSN Demand	Demand for NAVTEQ and Nokia Siemens Networks offerings increase due to favorable demand conditions	Core Business BetterEcon	Two of the three core business areas (CoreBusiness), namely NAVTEQ and NSN, begin to see enhanced demand due to the improvement of the general economic situation (BetterEcon)

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2010	Nokia annual report 2010: 3	Interview with a former NSN director Interview with a former Nokia product manager Interview with a former Nokia strategist Interview with a Symbian contractor Doz & Wilson, 2018: 6 Lamberg et al., 2019: 6 Siilasmaa & Fredman, 2018: 78, 82	NMP Comp Demand	The benefits of enhance demand conditions for mobile phones are undercut by competition	BetterEcon Android Phones NMPSales Respons	The improvement of general economic situation (BetterEcon) is undercut by the widespread introduction of Android phones (AndroidPhones) and the previous response to decreased sales through cost-cutting (NMPSalesRespons) had not addressed the root cause of decline which was the lack of new products
2010		Interview with a former Nokia product manager Nykänen & Salminen, 2014: 17-18 Ollila & Saukkomaa, 2013: 422 Siilasmaa & Fredman, 2018: 86-89	CEO Search	Nokia board initiates the search for a new CEO due to the company's weak performance	NMPComp Demand KallasvuoCEO	The poor financial performance of Nokia (NMPCompDemand) led the board of directors to initiate a search for a new CEO to replace Kallasvuo (KallasvuoCEO)
2010	Nokia annual report 2010: 8		NSN4G	Nokia Siemens Networks enhances its position in the 4G market by testing networks and announcing deals to provide 4G networks	NSNReorg2 MAPSNSN Demand	Following succesful refocusing (NSNReorg2) and enhanced demand (MAPSNSNDemand), NSN further enhances its position in the 4G market

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2010		Interview with a former Nokia product manager Interview with a former Nokia R&D director Interview with a former Nokia strategist Interview with a mobile technology expert Doz & Wilson, 2018: 120 Nykänen & Salminen, 2014: 20, 103, 124-125 Ollila & Saukkomaa, 2013: 426	AccelerateMeeGo	Scenario in which the development of MeeGo is accelerated in order to make it the primary operating system	NMPComp Demand NMPMeeGo	To address waning demand (NMPCompDemand), Anssi Vanjoki had investigated Nokia's R&D units and crafted a new strategy for the corporation that could have been used to accelerate the development of MeeGo (NMPMeeGo) in order to make it the primary operating system. This scenario was partly realized with the introduction of Nokia N9 phone that ran on MeeGo
2010		Interview with a former Nokia product manager Interview with a former Nokia project manager Interview with a former Nokia R&D director Doz & Wilson, 2018: 127-128	MeeGo Android	Scenario in which Nokia combines MeeGo and Android as the primary operating systems	NMPComp Demand NMPMeeGo AndroidPhones	To address waning demand (NMPCompDemand), Nokia senior executives have recounted that combining MeeGo (NMPMeeGo) and following competitors to the Android ecosystem (AndroidPhones) provided for a viable alternative for Nokia. Combining MeeGo and Android was later realized by a company called Jolla that was started by Nokia's former MeeGo developers after MeeGo development ended in Nokia.

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2010	Nokia annual report 2010: 3	Interview with a former Nokia project manager Interview with a former NSN director Lamberg et al., 2019: 6 Nykänen & Salminen, 2014: 11-15, 30 Ollila & Saukkomaa, 2013: 424-425	ElopCEO	Stephen Elop starts as the new CEO of Nokia	CEOSearch	The search for a new CEO (CEOSearch) leads to the appointment of Stephen Elop as the new CEO of Nokia. Simultaneously, Anssi Vanjoki who was the other top candidate resigned from Nokia
2011	Wall Street Journal, 18.2.2011	Interview with a former NSN director Siilasmaa & Fredman, 2018: 113-114 Nykänen & Salminen, 2014: 90-91	Microsoft	Microsoft seeks collaboration with Nokia regarding Windows Phone		
2011		Interview with a former Nokia product manager Interview with a mobile technology expert Nykänen & Salminen, 2014: 104-105 Siilasmaa & Fredman, 2018: 107	NMP MeeGo Fail	Top management realizes that MeeGo development lags too far behind in order to be viable platform	NMPMeeGo NMPComp Demand ElopCEO	In January 2011, Stephen Elop (ElopCEO) and Kai Öistämö reviewed the development of MeeGo (NMPMeeGo) and realized that the development of the operating system lags too far behind to be a viable alternative that could address waning demand (NMPComp Demand)

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2011		Interview with a former Nokia product manager Interview with a former Nokia R&D director Interview with a former Nokia strategist Interview with a former Nokia VP Interview with a mobile technology expert Doz & Wilson, 2018: 119, 127-128 Nykänen & Salminen, 2014: 96-98, 103 Siilasmaa & Fredman, 2018: 111-112	Android	Scenario: Nokia chooses Android as the main OS	NMP MeegoFail Android Phones	Following the realization that MeeGo is a failure (NMPMeegoFail), Nokia's top management considered following their competitors (AndroidPhones) and choosing Android as the primary OS. This was also negotiated with Google.
2011	Nokia annual report 2010: 12 Nokia annual report 2011: 3 Microsoft press release, 10.2.2011	Interview with a former Nokia VP Interview with a former NSN director Interview with a mobile technology expert Lamberg et al., 2019: 6, 14, 15 Nykänen & Salminen, 2014: 104, 107 Siilasmaa & Fredman, 2018: 126	NMP Microsoft	Nokia announces collaboration with Microsoft to make Windows phone its primary platform for smartphones	NMP MeegoFail Microsoft	Following the realization that MeeGo is a failure (NMPMeegoFail) and attempts of Microsoft to initiate collaboration (Microsoft), Nokia decides to initiate collaboration with Microsoft to use Windows phone as the primary platform
2011	Nokia annual report 2010: 3 Nokia annual report 2011: 3	Nykänen & Salminen, 2014: 112	NMP Reorg	Mobile phone unit assumes a new structure with one unit focused on smartphones and one unit focused on mobile phones	NMPMicrosoft	Following the decision to focus on Windows phone (NMPMicrosoft), the mobile phone is restructured into two units, one focusing on smartphones and another focusing on mobile phones

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2011	Nokia annual report 2011: 3	Interview with a former Nokia contractor Interview with a mobile technology expert Interview with a Symbian contractor Lamberg et al., 2019: 10 Nykänen & Salminen, 2014: 142	Symbian Divest	Symbian development is outsourced to Accenture	NMPMicrosoft	Following the decision to focus on Windows phone (NMPMicrosoft), Symbian development is outsourced to Accenture
2011	Nokia annual report 2011: 3, 11 Nokia annual report 2010: 9 Nokia press release, 29.4.2011		NSN Motorola	Nokia Siemens Networks acquired Motorola Solutions that enhanced market position especially in North America and Japan	NSN4G	Following the move to enhance market position in 4G markets, Nokia also aims to enhance global market position by acquiring Motorola Solutions
2011		Interview with a mobile technology expert Siilasmaa & Fredman, 2018: 10	Comp Tighten	Competing smartphone platforms gain market share in all key markets	iPhone Android Phones	Following the introduction of iPhone (iPhone) and Android phones (AndroidPhones), competition tightens and the new platforms start to gain market share in key markets
2011	Nokia annual report 2011: 8	Interview with a former Nokia VP Interview with a mobile technology expert Nykänen & Salminen, 2014: 140, 185	NMP Decline	Nokia smartphone sales continue declining as competitors gain market share	CompTighten NMPReorg	Tightening competition in all key markets (CompTighten) and the incapacity of the new smartphone unit (NMPReorg) to launch a Windows phones caused Nokia smartphone sales to continue plummeting, while Symbian phones stopped selling almost instantly

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2011	Nokia annual report 2011: 3		NSN NewStrat	Nokia Siemens Networks presents a new strategy to focus on wireless broadband and services, while initiating a widespread global reorganization program	NSNMotorola	Following the acquisition of Motorola Solutions (NSNMotorola), NSN presents a new strategy accompanied by a reorganization program
2011	Nokia annual report 2011: 8 Nokia annual report 2012: 7	Interview with a former Nokia VP Nykänen & Salminen, 2014: 197-200, 233-234	NMP Reorg2	Mobile Phones unit is further restructured, new cost cutting initiatives are introduced and investments are directed towards smartphones and services	NMPDecline	Following declining sales (NMPDecline), the mobile phone unit initiates further restructuring and cost cutting initiatives in order to strengthen the smartphone and service areas
2012	Nokia annual report 2012: 11 Nokia annual report 2013: 11	Nykänen & Salminen, 2014: 294	NSN Cost Cutting	Nokia Siemens Networks initiates cost-cutting initiatives in order to cut costs heavily by the end of 2013	NSNNewStrat	Following the new strategy (NSNNewStrat), NSN initiated cost-cutting initiatives to regain competitiveness
2012		Lamberg et al., 2019: 10 Nykänen & Salminen, 2014: 172	NMPAsha	ASHA becomes the successor of Meltemi and becomes the OS for low-end mobile phones	NMP Meltemi	Due to the slow development of Meltemi (NMPMeltemi), ASHA replaces it as the new OS for low-end mobile phones
2012	Nokia annual report 2012: 64 Yle news 3.5.2012	Nykänen & Salminen, 2014: 284-288 Siilasmaa & Fredman, 2018: 133-134	Siilasmaa Board	Risto Siilasmaa becomes the chair of the board and reorients the board towards strategy work	Ollila Chairman	Risto Siilasmaa becomes Nokia's chairman of the board as the longtime chairman Jorma Ollila steps down from the position (OllilaChairman)
2012	Nokia annual report 2012: 13		MAPS Position	HERE strengthens its position in the corporate market, especially in the automotive industry	MAPSNSN Demand	Following enhanced demand (MAPSNSNDemand), HERE further strengthens its position in the corporate market.

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2012	Microsoft press release, 18.6.2012	Nykänen & Salminen, 2014: 216 Siilasmaa & Fredman, 2018: 172	Microsoft Surface	Microsoft introduced Surface tablet to everyone's surprise		
2012		Siilasmaa & Fredman, 2018: 189-192	Response Planning	Nokia management begins to develop scenarios in order to respond to events that may result from the introduction of Surface tablet	NMPReorg2 Siilasmaa Board Microsoft Surface	Due to the poor performance of the mobile phone unit (NMPReorg2), Siilasmaa (SiilasmaaBoard) orients the board to scenario work in order to respond to Microsoft's introduction of the Surface tablet (Microsoft Surface)
2012	Nokia annual report 2014, p. 38	Interview with a mobile technology expert Siilasmaa & Fredman, 2018: 181 Nykänen & Salminen, 2014: 288-289, 301	Microsoft Android	Scenario on which Nokia renegotiates collaboration with Microsoft and starts to develop phones that use Microsoft and Android operating system	Response Planning	As a consequence of scenario planning (ResponsePlanning), the possibility of renegotiating contract with Microsoft in order to expand into Android phones is considered. This plan was also partly realized since Nokia launched three Nokia series X phones that ran on Android before selling the mobile phone business to Microsoft.

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2013	The official meeting material of the extraordinary general meeting of Nokia Corporation, 18.9.2013	Siilasmaa & Fredman, 2018: 193-194, 198-200	Microsoft Proposal	Microsoft initiates negotiations to acquire Nokia mobile phones	Microsoft Surface	Following Microsoft's intentions to expand into hardware business (MicrosoftSurface), Steve Balmer contacted Nokia's head of the board of directors Risto Siilasmaa on February 2013 to initiate discussion on the acquisition of Nokia's mobile phones
2013	Nokia annual report 2013: 5 Microsoft press release, 3.9.2013	Lamberg et al., 2019: 6 Nykänen & Salminen, 2014: 283, 288-289 Siilasmaa & Fredman, 2018: 252-254, 280	NMP Divest	The mobile phone unit is sold to Microsoft	Response Planning Microsoft Proposal	Following one of the developed scenarios (ResponsePlanning), the negotiations with Microsoft are concluded (MicrosoftProposal) and the mobile phone business is sold to Microsoft.
2013	Nokia annual report 2013: 2 Siemens press release, 1.7.2013 Nokia press release, 1.7.2013 The official meeting material of the extraordinary general meeting of Nokia Corporation, 18.9.2013	Nykänen & Salminen, 2014: 283, 293-294	NSNacq	Nokia buys Siemens out from Nokia Siemens Networks and renames the company Nokia Solutions and Networks (NSN)	NMPDivest NSN CostCutting	Following the divestment of the mobile phone business (NMPDivest), Nokia acquired full ownership of NSN which financial situation was rapidly strengthened by the previous restructuring efforts (NSNCostCutting)

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2014	Financial Times 29.4.2014 Nokia annual report 2013: 5	Siilasmaa & Fredman, 2018: 282	SuriCEO	Rajeev Suri becomes the new CEO of Nokia	ElopCEO NMPDivest	Following the divestment of the mobile phone business (NMPDivest), Stephen Elop (ElopCEO) transitioned to Microsoft and Rajeev Suri becomes the new CEO of Nokia
2014	Nokia annual report 2013: 4 Nokia annual report 2013: 6	Siilasmaa & Fredman, 2018: 266-267	NewStrat2	Nokia announces its new strategy that is focused on three business areas: Networks, HERE, and Nokia Technologies	NMPDivest NSNAcq SuriCEO	Following the divestment of mobile phones (NMPDivest) and the acquisition of NSN (NSNAcq), the new CEO Raveej Suri (SuriCEO) announced Nokia's new strategy
2014	Nokia annual report 2014: 9	Siilasmaa & Fredman, 2018: 259, 266-267	MAPS Focus	HERE now focuses mainly on corporate clients, especially the automotive industry	MAPSPosition NewStrat2	Following HERE's success in the corporate market (MAPSPosition) and Nokia's new strategy (NewStrat2), HERE now mainly focused on corporate clients
2014	Nokia annual report 2014: 9	Siilasmaa & Fredman, 2018: 259, 266-267	Patent Commerce	Nokia technologies begins commercializing its patent portfolio	NewStrat2	Following Nokia's new strategy (NewStrat2), Nokia technologies focused on commercializing patents
2015	Nokia annual report 2015: 9 Nokia press release, 15.4.2015 Nokia press release, 14.1.2016 Nokia press release, 2.11.2016	Siilasmaa & Fredman, 2018: 290-292, 304	NSN Alcatel	Nokia acquires Alcatel Lucent which positions Nokia as the world's second largest telecom network infrastructure firm	NewStrat2	Following Nokia's new strategy (NewStrat2), the corporation acquires Alcatel Lucent to further solidify its position in the telecom network market

TABLE B2
Continued

Year	In situ data	Retrospective data	ETHNO code	Event	Prerequisite events	Logic of prerequisite events
2015	Nokia annual report 2015: 2 Nokia press release, 4.12.2015		MAPS Divest	HERE is sold to German group of car manufacturers due to strategic focusing on networks	NSNAlcatel MAPSFocus	Following the acquisition of Alcatel Lucent (NSNAlcatel) that shifted Nokia's focus further into networks, HERE is sold to a German group of car manufacturers who were already HERE clients (MAPSFocus)

APPENDIX C

Cross-Period Analysis on the Emergence of Alternative Strategic Change Scenarios

Table 1 below presents a characterization of the strategic change scenarios that emerged in the two periods. This characterization supports our analysis of whether and to what extent aspects of chance explain the convergence of the strategic choice on those scenarios. We analyze the scenarios on three dimensions. The first dimension relates to the classification of the immediately preceding event eliciting a given scenario as contingent (unforeseeable) vs. non-contingent (foreseeable). The second dimension relates to whether the event immediately preceding the emergence of the scenario was an external event or whether it was an event internal to Nokia, such as a previous strategic decision. The third dimension pertains to the timing of the emergence of a scenario, simply whether a scenario was the last one to emerge during a period or not.

TABLE 1**Cross-Period and Cross-Scenario Analysis of Whether the Strategic Change Scenario****Eventually Chosen Emerged Similarly in the Two Periods**

Scenario	(1) Preceding event contingent?	(2) Preceding event external?	(3) The last scenario to emerge?
Period 1 (1989-92)			
a) Entering in corporate partnership in Consumer Electronics and/or Information Systems	No	Yes (talks with Japanese)	No
b) Pursuing a turnaround of Consumer Electronics and/or Information Systems	No	No (own decision to divest Paper, Power, etc.)	No
c) Selling the company off as a whole or in pieces	Yes (Finnish banking crisis)	Yes (Finnish banking crisis)	No/Yes (last together with d)
(d) Focusing on Mobile Phones, Tele Networks, and Cables (divesting all other businesses)	Yes (USSR collapsing; recovery)	Yes (USSR collapsing; recovery)	No/Yes (last together with c)
Period 2 (2009-12)			
a) Accelerating the development of Meego operating system	Yes (new market entrants)	Yes (new market entrants)	No
b) Choosing Google's Android OS as the main OS	No	Yes/No (external/internal Symbian problems)	No
c) Utilizing both Microsoft's (WindowsPhone) and Google's (Android) OSs	Yes (collaboration w/ Microsoft)	No (own decision to collaborate)	No/Yes (together with d)
d) Selling Mobile Phones and Smartphone units to Microsoft	No	Yes/No (lack of demand for WindowsPhones)	No/Yes (together with c)

From the table above, we can observe that none of the three dimensions is, alone or together with the other dimensions, a sufficient condition for the surprising convergence of the eventual strategic choice on scenario (d) in the two analyzed periods. When it comes to the first dimension, the preceding event eliciting scenario (d) was a contingent, unforeseeable event in the first period (the collapse of USSR and the surprisingly quick recovery of Nokia's business), but

in the second period, the preceding event was non-contingent (continued sales decline of Nokia smartphones with the Windows Phone OS). Thus, the contingency of the event eliciting the scenario does not seem to consistently lead to a surprising scenario being chosen. Regarding the second dimension, the preceding event was clearly external in the first period (collapse of USSR, again), whereas in the second period, it was both internal and external (inability to develop sufficiently attractive devices with Windows Phone). In other words, the nature of the event eliciting the scenario as external does not consistently lead to the surprising scenario. When it comes to the third dimension, in turn, the scenario eventually chosen (d) was among the last scenarios to emerge in both periods, but in both periods, scenario (c) emerged approximately equally late. Hence, the emergence of a scenario as the last one does not consistently explain its choice.

Because elements of chance in the emergence of the above strategic change scenarios do not seem to convincingly explain the convergence of the eventual strategic choice on one of the scenarios, we next analyze the role of chance in the closure of the scenarios and, thereby, in the eventual convergence on one scenario.

Cross-Period Analysis on the Closure of Alternative Strategic Change Scenarios

When we analyzed the emergence of the alternative strategic change scenarios, we concluded that there were no chance aspects or conditions in the emergence of the strategic change scenarios that would have consistently explained why Nokia's top management eventually converged on choosing the scenarios they did. This conclusion reinforces the importance of making observations about the closure of scenarios across the two periods. In Table 2, we analyze the scenarios in three dimensions. Note that these dimensions are different from those

analyzed for the emergence of the scenarios in Table 1. This is because for the emergence of the scenarios, the focus was on the presence or absence of chance elements (e.g., contingent, unforeseeable nature) in the events eliciting the scenarios within the firm's emergent strategy process. In the closure of the scenarios, each of the intersections is assumed to be a conjuncture centrally elicited by chance, according to our research framework.

Table 2 focuses on identifying different types of chance-elicited conjunctures that manifest at the intersections of the scenarios and the parallel event sequences, instead of analyzing whether individual events were based on chance or not. We conducted this analysis by identifying common themes in the conjunctures that occurred within as well as across the two periods. Consequently, we iteratively grouped the event sequences with common themes together into higher-level categories, aiming to find an optimal level of categorization so that there would be at least three, but no more than six, event sequence intersections falling into each higher-level category during the two periods. The lower-level sub-categories could include one to three conjunctures. The following categorization groups relevant conjunctures into the following primary classes:

- i. Unexpected changes in top management members*
 - a. Appointment of a new top management member with prior personal attachment to a scenario
 - b. Appointment of a new top management member with no strong preferences for any scenarios.
- ii. External agency representing changes in other stakeholders' preferences or behavior*
 - a. Sudden strategic decisions of key business partners
 - b. Performance disruption of key business partners

- c. Newly emerged preference alignment of major owners.

Furthermore, in addition to the above mentioned conjunctures, some of the conjunctures were identified as arising from domino effects occurring between different scenarios, as a result of one scenario's viability being substantially decreased or increased. In other words, such conjunctures occurred whenever the viability of one scenario was significantly impacted by the elimination of another scenario. As sub-categories of such domino effect conjunctures, we identified the following:

iii. Scenario domino effects

- a. An intersected scenario being a key means for another scenario
- b. An intersected scenario being a key complement for another scenario
- c. An intersected scenario being a key (remaining) alternative to another scenario.

Four key observations can be made based on the cross-case and cross-scenario analysis of Table

2.

TABLE 2

Cross-Period and Cross-Scenario Analysis of the Influence of Conjuncture Types on the Viability of Alternative Scenarios

Scenario	(i) Unexpected changes in top management members		(ii) Unexpected changes in other stakeholders' behaviour or preferences			(iii) Scenario 'domino' effects		
	Appointment of a new top management member with prior personal attachment with a scenario	Appointment of a new top management member with no strong preferences for any scenario	Sudden decision of key business partners	Performance disruption of key business partners	Newly-emerged preference alignment of major owners	An intersected scenario being a key means for another scenario	An intersected scenario being a key complement for another scenario	An intersected scenario being a key (remaining) alternative to another scenario
Period 1 (1989-92)								
a) Entering in corporate partnership in Consumer Electronics and/or Information Systems	N/A	N/A	① Negative	N/A	N/A	N/A	N/A	N/A
b) Pursuing a turnaround of Consumer Electronics and/or Information Systems	N/A	N/A	N/A	N/A	N/A	② Negative	② Negative	N/A
c) Selling the company off as a whole or in pieces	N/A	N/A	N/A	N/A	③ Negative	N/A	N/A	N/A
(d) Focusing on Mobile Phones, Tele Networks, and Cables	⑤ Positive	N/A	N/A	N/A	N/A	N/A	N/A	④ Positive
Period 2 (2009-12)								
a) Accelerating the development of Meego OS	② Negative	N/A	N/A	① Negative	N/A	N/A	N/A	N/A
b) Choosing Google's Android OS as the main OS	N/A	N/A	N/A	N/A	N/A	N/A	② Positive	③ Positive ⑤ Negative
c) Utilizing both Microsoft's (WindowsPhone) and Google's (Android) OSs	N/A	N/A	④ Positive ⑥ Negative	N/A	N/A	N/A	N/A	N/A
d) Selling Mobile Phones and Smartphone units to Microsoft	N/A	⑧ Positive	N/A	N/A	N/A	N/A	N/A	⑦ Positive

Notes. The circled numbers refer to the intersections of event sequences depicted in Figure 2 (period 1) and Figure 3 (period 2)

First, it seems that none of the individual sub-types of conjunctures consistently exerted positive or negative⁴ influence on the scenario in question. In most columns indicating the sub-types of conjunctures, there are both positive and negative influences on the viability of different scenarios. In other words, the direction of influence of any particular conjuncture sub-type on the viability of the scenarios is not likely to be consistent across different scenarios and the two periods. Of course, in some columns, there is only one instance of either positive or negative influence for that conjuncture sub-type (e.g., one negative mention in the column “Newly emerged preference alignment of major owners”). However, having only one appearance per column does not allow to us to convincingly conclude, for example, that when the conjuncture is of type ‘newly emerged preference alignment of major owners’, the viability of the scenario always decreases.

Second, as a corollary to the first observation, none of the individual sub-types of conjunctures seems, in its own right, to consistently lead to either the choice of one scenario or the rejection of the other scenarios. Namely, there are no columns in Table 2 that would include positive conjunctures for both of the scenarios eventually chosen, while not including positives for any of the non-chosen scenarios. Nor are these any columns that would feature at least two negatives (and no positives) for the non-chosen scenarios and no negatives for the chosen scenarios. In other words, we can safely infer that it is not any individual sub-type of conjuncture alone that acts as a sufficient condition for the convergence of the strategic choice on one scenario and the rejection of others. The only exception emerges if we consider the two sub-types of the conjuncture “Unexpected changes in top management members” that are

⁴ A positive influence makes a scenario more viable, but a negative influence makes it less viable.

“Appointment of a new top management member with prior personal attachment with a scenario” and “Appointment of a new top management member with no strong preferences for any scenario”. In this case, we can observe positive influence of this conjuncture type on the viability of the scenario eventually chosen in both periods. In other words, there is some evidence that if the parallel event sequence that intersects with a scenario involves substantial changes in top management, such as a new top management member having a personal attachment with a certain scenario or no personal attachment for any other alternative scenarios, then the strategic choice may converge on that scenario with an increased likelihood.

Third, despite the fact that none of the identified sub-types of conjunctures alone seems to be a sufficient condition for the choice of a certain scenario, an overall analysis of Table 2 suggests that what leads to the convergence of the strategic choice on a certain scenario is that its viability is *not* negatively influenced by parallel event sequences related to *any* of the conjuncture types. Inversely, what leads to a rejection of any alternative scenario is that their viability *is* negatively influenced by parallel event sequences related to at least *some* of the aforementioned conjuncture types. Nevertheless, it must be noted that it still remains somewhat unclear whether the aforementioned negative influences by the conjunctures on the viability of all alternative scenarios is a sufficient cause for the convergence of the strategic choice on such a remaining scenario whose viability is *not* negatively influenced by any conjuncture, or whether the latter scenario’s viability also has to be positively influenced by some (other) conjuncture type, for it to be chosen.

Finally, the above observation that the choice of one scenario vs. rejection of others is being driven by a combination of negative and positive influences by the different conjuncture types on the alternative scenarios allows us to make a further overall observation about the role

of chance in influencing strategic choice. Notably, even if we identified both periods of change at Nokia to be influenced by multiple chance-elicited conjunctures as indicated in Table 2, none of these conjunctures alone can be argued to have *per se* caused the surprising strategic choices at Nokia in the two periods. This is an important observation, because if there were so many chance-elicited conjunctures occurring, as we observed, and if many of them could *alone* explain the surprising, unexpected strategic choice taking place, then the eventual choice would not have been that unexpected after all.

In other words, if multiple low-probability events and the resulting conjunctures could all, alone, lead to the same surprising choice outcome, then adding up the probabilities across the conjunctures would mean that the sum of the low probabilities would in fact become very high—and the unexpected outcome would actually become an expected one. In contrast, our main finding is that all or at least most of the those low-probability conjunctures *needed to co-occur* to actually decrease the viability of all but one of the strategic choice scenarios. This means that we should rather think in terms of multiplying the low probabilities of the conjunctures with each other than in terms of adding up their probabilities. Multiplying several low probabilities with each other leads to a very or extremely low probability of the outcome event (e.g., $0.1 * 0.1 = 0.01$). This provides an additional explanation as to why the eventual choice of divesting the core businesses at Nokia was a highly chance-based strategic choice with very low overall probability to occur at the first place. Yet, through the developments described and analyzed above in detail, these strategic choices took place.