



Distributed Attention and Shared Emotions in the Innovation Process: How Nokia Lost the Smartphone Battle

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Abstract

We conducted a qualitative study of Nokia to understand its rapid downfall over the 2005–2010 period from its position as a world-dominant and innovative technology organization. We found that top and middle managers' shared emotions during the smartphone innovation process caused cycles of behaviors that harmed both the process and its outcome. Together, organizational attention structures and historical factors generated various types of shared fear among top and middle managers. Top managers were afraid of external competitors and shareholders, while middle managers were mainly afraid of internal groups, including superiors and peers. Top managers' externally focused fear led them to exert pressure on middle managers without fully revealing the severity of the external threats and to interpret middle managers' communications in biased ways. Middle managers' internally focused fear reduced their tendency to share negative information with top managers, leading top managers to develop an overly optimistic perception of their organization's technological capabilities and neglect long-term investments in developing innovation. Our study contributes to the attention-based view of the firm by describing how distributed attention structures influence shared emotions and how such shared emotions can hinder the subsequent integration of attention, influencing innovation processes and outcomes and resulting in temporal myopia—a focus on short-term product innovation at the expense of long-term innovation development.

Keywords: innovation process, shared emotion, cognition, attention-based view of the firm, smartphone, temporal myopia

Innovation requires highly effective information sharing between various organizational groups. For example, top managers are expected to translate prioritized

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strategic themes into actionable goals for middle management, while the latter are expected to coordinate with each other and report upwards on the progress of implementation to enable corrective actions (e.g., March and Simon, 1958; Ethiraj and Levinthal, 2004). Such integration of attention between organizational groups (Joseph and Ocasio, 2012) is important for innovation because of interdependencies relating to a host of factors, including diverse units' tasks, technologies, organizational capabilities, and changing market expectations (e.g., Garud, Tuertscher, and Van de Ven, 2013).

Prior scholars have studied the innovation process and the related communication and integration of attention mainly from structural (e.g., Henderson and Clark, 1990; Ocasio, 1997, 2011) and cognitive perspectives (e.g., Gavetti et al., 2012; Eggers and Kaplan, 2013), but these theoretical perspectives do not fully explain why various organizational groups often find it hard to integrate their knowledge through communication. Though the generation of structural channels to enable interaction between groups such as top and middle managers might foster comprehensive information sharing between them (Joseph and Ocasio, 2012), the mere existence of such channels may not be sufficient, as people may still avoid bringing up sensitive issues or refuse to listen to others during their interaction episodes. Several case studies have described the challenges of companies using various structural arrangements and have alluded to the persistence of poor mutual understanding between top and middle managers in the innovation process (Leonard-Barton, 1992; Tripsas and Gavetti, 2000; Repenning and Sterman, 2002; Gilbert, 2005). In a recent noteworthy example, President Obama said, "I would not have launched Healthcare.gov if I had known it wasn't going to work" (*The Verge*, 2013), while many managers in his administration seemed to have been long aware of the platform's technical problems (*Economist*, 2013; *Washington Post*, 2013). Research has also shown that middle managers' understandings often evolve to be quite different from top managers' perceptions and intentions (Balogun and Johnson, 2004; Huy, Corley, and Kraatz, 2014).

In addition to being influenced by structures and cognition, intergroup communication processes could be influenced by emotions, which have remained underexamined in research on organizational innovation (see Garud, Tuertscher, and Van de Ven, 2013; Anderson, Potočnik, and Zhou, 2014, for reviews). To the extent that the innovation process or its outcomes can have major consequences for people's well-being, various groups participating in innovation may experience strong emotions (cf. Lazarus, 1991; Elfenbein, 2007). Basic research has shown that emotions influence people's choices and behaviors (e.g., Izard, 2009; Phelps, Lempert, and Sokol-Hessner, 2014). Emotions also influence social processes in substantial ways (e.g., Hareli and Rafaeli, 2008; Niedenthal and Brauer, 2012), and scholars have found that emotions can significantly influence organization members' thinking and behavior related to strategy implementation (Huy, 2011; Huy, Corley, and Kraatz, 2014). Furthermore, emotions often come to be shared within organizational groups because group members attend to similar things and share their emotions socially (e.g., Elfenbein, 2014; Menges and Kilduff, 2015). At the same time, there could be intergroup differences, as each group is primarily focused on its own task and well-being (e.g., Cyert and March, 1963; Ocasio, 1997). Shared emotions could thus provide a complementary mechanism for understanding how organizational groups communicate, coordinate, and act during the innovation process, influencing its outcomes.

One of the dominant lenses for organizational innovation has its origins in the Carnegie School (e.g., Simon, 1947; March and Simon, 1958), which in many ways has sought to answer the question, "Given that individuals are boundedly rational, how should we design organizations?" A key insight has been that organizations need both specialization (leading to differentiation) and integration. Specialization is needed because no individual can handle everything, while integration is needed to combine different viewpoints (see also Ocasio, 1997; Joseph and Ocasio, 2012). Different levels of differentiation and integration seem to lead to varying problems. For example, as specialization increases, employees and managers have to escalate more issues further upward, which can slow down innovation (Burns and Stalker, 1961). And when communication channels are optimized for the refinement of current products, various units may fail to integrate their views during the design of radically new products (Henderson and Clark, 1990), while others may not see a critical need for them (Christensen and Bower, 1996).

Unfortunately, the theoretical mechanisms underlying the structural–cognitive perspective have remained decoupled from emotions. Scholars have analyzed organizations as systems whose elements process information in an affect-free way and have remained largely indifferent to how various organization members might feel differently about the information they use or react to it in different ways (see Gavetti et al., 2012, for a review). Yet emotions could become relevant to the extent that people see the serious implications of the information they are processing, which triggers emotions when those implications have personal relevance for them (e.g., Lazarus, 1991). As innovation often has significant personal relevance, participants in the innovation process could experience strong emotions in regard to the information they process and could also influence each other's emotions as they grapple with various important situations (cf. Hareli and Rafaeli, 2008). Even though many works have hinted that emotional reactions might influence people's behavior inside structural communication channels during the innovation process (e.g., Burns and Stalker, 1961; Fang, Kim, and Milliken, 2013; Reitzig and Maciejovsky, 2014), very few, if any, empirical field studies have examined how various groups' emotions emerge during the innovation process and what the impacts are. Hence a deeper and more holistic understanding of the innovation process would require a joint investigation of how both emotional reactions and bounded rationality influence the innovation process and its outcomes.

We carried out an inductive study of Nokia's failure to produce a next-generation smartphone in response to Apple's iPhone. This case allowed us to develop a deeper understanding of the emergence of shared emotions during the innovation process and their influence on innovation because it represents an extreme case for theory building. Rapid changes in Nokia's competitive environment put severe pressure on firm members and amplified their emotions, making the influence of those emotions particularly salient.

INNOVATION AND EMOTION

We follow Elfenbein (2007: 315) in viewing emotion as a process that "begins with a focal individual who is exposed to an eliciting stimulus, registers the stimulus for its meaning, and experiences a feeling state and physiological changes, with downstream consequences for attitudes, behaviors, and

cognitions, as well as facial expressions and other emotionally expressive cues." A distinguishing characteristic of emotions is that they have a target, which is a crucial element because the action tendencies associated with emotions relate to the target of the emotion (e.g., Russell, 2003; Damasio and Carvalho, 2013). For example, fear can make people either get a vaccination or avoid one, depending on whether the target of their fear is the disease to be prevented or potential harmful side effects of the vaccination itself. Hence, to understand how emotions might influence the innovation process, it is important to investigate the target of the emotion in addition to observing whether the emotion is present.

Emotions activate action tendencies rather than fixed actions (Ellsworth and Scherer, 2003). For example, fear can lead to increased heart and respiratory rates, freeze or flight behaviors, and "attentional behaviors," leading to attention to the cause (Damasio and Carvalho, 2013: 145; see also Lazarus, 1991; Ellsworth and Scherer, 2003). Action tendencies' main purpose is to help the individual achieve a favorable person–environment relationship in the particular situation (Lazarus, 1991; see also Damasio and Carvalho, 2013). By directing attention to the particular target that triggers the emotion, emotion facilitates actions that address that particular target, while also temporarily reducing attention to other matters. Even though emotional reactions are usually adaptive, they sometimes cause people to prefer small short-term benefits over large long-term benefits (e.g., Phelps, Lempert, and Sokol-Hessner, 2014) or to take actions that avoid tolerable short-term harm but risk causing catastrophic long-term consequences (e.g., Kahneman, 2011: Part 4).

The emotion that people experience toward a particular target depends on how they perceive that target's implications for themselves (e.g., Ellsworth and Scherer, 2003; Russell, 2003; Izard, 2009). The target need not be physically present: recalled and imagined targets can also trigger emotion, as can abstract concepts such as money and power (e.g., Ellsworth and Scherer, 2003; Damasio and Carvalho, 2013). Appraisal theories of emotion suggest that people appraise specific dimensions in a target that determine the emotion they come to experience (Ellsworth and Scherer, 2003). Lazarus (1991) suggested that the appraisal process has two stages: a primary and secondary stage. For example, people are likely to experience fear when their primary appraisal suggests potential harm to their well-being and their secondary appraisal suggests that the outcome of the situation is uncertain or beyond their control. Even though emotion theories do not fully agree on the details of the process through which people come to experience emotions, there is enough alignment that appraisal theories give us an effective tool for understanding and inferring how and why people experience emotions during the innovation process (see also Elfenbein, 2007, 2014; Menges and Kilduff, 2015).

Emotional states can be fleeting, such as the fear triggered by a sudden loud noise, or longer lasting, such as the fear of terrorism (e.g., Izard, 2009). When an emotion is said to be longer lasting, it usually refers to people experiencing the same emotion multiple times toward the same target over a long period, repeating the appraisal process continuously until the situation is resolved (Ellsworth and Scherer, 2003). In organizational settings, emotional states that recur consistently over time are likely to have a more systematic effect on the innovation process than occasional fleeting emotions: though the former have an iterative, cumulative influence, the latter may be too rare to form accumulating patterns and may also have partly opposing influences that cancel each other out when emotions fluctuate.

Fear, Threat Rigidity, and Shared Emotions during the Innovation Process

The innovation process can be laden with emotion in part because of the uncertain, prospective, yet highly consequential nature of the innovation journey. Innovators are trying to create things that do not yet exist by leveraging technological components of uncertain market potential. Because of this prospective orientation, future-oriented emotions such as hope and fear (Baumgartner, Pieters, and Bagozzi, 2008) are particularly likely to arise. Negative emotions tend to command more attention than positive ones because they evolved to help people ensure their survival, or at least avoid harm (Baumeister et al., 2001). As a result, fear—as a future-oriented negative basic emotion—could play a critical role in the innovation process (see Baumgartner, Pieters, and Bagozzi, 2008; Izard, 2009). A second reason that we might expect fear to be central to innovation is that other past-oriented negative emotions that people may feel during the innovation process—such as shame or envy—can turn into fear. When people experience such a negative past-focused emotion and then imagine a similar future situation, they may fear the same negative outcome occurring again (cf. Dane and George, 2014). For example, one can feel shame after having given a bad presentation and therefore fear that the next presentation will also fail.

Because fear is related to the perception of threat, the literature on threat rigidity could inform us. The original threat-rigidity theory hypothesized some mechanisms that cause organizations to respond in a rigid way to an external threat (Staw, Sandelands, and Dutton, 1981), including increased emotional arousal, which narrows top managers' thinking, constrains communication, and makes middle managers more dependent on them. The hypothesized mechanisms of the threat-rigidity theory remain largely speculative, however, and have not been empirically verified. The original theory assumes that the whole organization would perceive the threat in a similar way and develop homogeneous cognitive-emotional reactions that cause collective rigidity. Empirical tests have measured only the presence of the threat perceptions with proxies such as return on assets (Greve, 2011), bargaining cycles (Griffin, Tesluk, and Jacobs, 1995), changes in the studied firms' funding sources (D'Aunno and Sutton, 1992), and changes in the performance of an acquired unit (Shimizu, 2007) rather than various groups' actual perceptions of the threat and resulting behavior inside the organization. This is problematic because some case studies have suggested that various units in the same organization could differ in their perceptions of whether a new technology constitutes a threat or an opportunity—or whether it is simply irrelevant (Tripsas and Gavetti, 2000; Gilbert, 2005). Gilbert (2005) showed that different threat perceptions influenced how independent units performed their tasks. These differing perceptions could also influence the emotions people feel in the different units and how these units consequently interact with one another in the organizational innovation process. Such differences in threat perceptions among organizational groups might arise due to the influence of their varied positions in the organizational structure. If groups specialize in different tasks and focus on different matters, they probably perceive things differently and regard some matters as more important than others. Differing emotions between groups may thus arise (cf. Lazarus, 1991) as a result of the structural distribution of attention (Ocasio, 1997).

Because of the social psychology of organizational structures, people may also perceive threats to their status and power within the focal structure, which

can trigger strong emotions. A key characteristic of the organizational hierarchy is that it confers unequal formal status on various organization members through titles, roles, and responsibilities (e.g., Simon, 1947; Magee and Galinsky, 2008). Such formal status interacts with informal status to determine individuals' power—the extent of their control over resources that other members value (Pfeffer, 1981). Many organization members thus value status and compete with one another to reach or maintain high organizational status (Rosenbaum, 1979; Magee and Galinsky, 2008) and may feel strong emotions if they perceive related threats (cf. Lazarus, 1991). Less is known, however, about how such potential emotions related to seeking status influence their behaviors during the innovation process.

People's status also influences the emotions they experience (Ellsworth and Scherer, 2003: 580). In particular, low-status people may have a hard-wired, evolutionary-based fear of high-status people because, in the past, individuals with higher status would have controlled resources critical for survival (Kish-Gephart et al., 2009). Status differences can also determine the sequence of emotions felt among individuals (cf. Hareli and Rafaeli, 2008). For example, status can turn anger into fear: if an employee expresses anger toward a superior, he or she is likely to respond in kind, which causes the employee to feel fear (cf. van Kleef, De Dreu, and Manstead, 2004). Status differences could thus cause people to differ in how they construe a threat and to experience different emotions, while people of similar status are more likely to perceive a threat in a similar way and to experience similar emotions.

Likewise, though the structural distribution of attention likely generates between-group differences in emotions, it could foster within-group similarities. Members of the same group likely attend to similar things and perceive that those things have similar implications for them. Group members may thus experience emotions similar to their peers consistently over time regarding issues that they see as key to the group's welfare (Elfenbein, 2014; Menges and Kilduff, 2015). For example, if a group is exposed to fast time pacing in product development, members may develop a shared fear of missing deadlines (cf. Brown and Eisenhardt, 1997). Thus, just as group members may share similar mental models (Mathieu et al., 2000; Healey, Vuori, and Hodgkinson, 2015), they may also share similar emotions (see Mackie, Devos, and Smith, 2000; Huy, 2011; Elfenbein, 2014; Menges and Kilduff, 2015).

Shared emotions would cause many individuals to experience similar action tendencies (e.g., Elfenbein, 2014; Menges and Kilduff, 2015) and might make them behave in similar ways as a result of socialization processes (cf. Smith, Seger, and Mackie, 2007; Huy, 2011). But little empirical research has examined whether and how macro-level organizational structures and other factors generate similar or different emotions within and between key organizational groups and how such shared emotions influence the organizational innovation process and its outcome.

METHOD

We analyzed Nokia's rise and fall in the smartphone industry between 2005 and 2010. By the end of 2007, half of all smartphones sold in the world were Nokias, while Apple's iPhone had a mere 5 percent share of the global market

(Gartner, 2009). Nokia had bountiful economic and intellectual resources, had dominated the industry for years with a stream of innovative models, and was frequently put forward as a world-class exemplar of strategic agility (Doz and Kosonen, 2008; Steinbock, 2010). But by the fall of 2010, despite significant efforts, Nokia had failed to introduce a smartphone to match the iPhone, creating the perception that it was losing the battle against Apple. Nokia replaced its chief executive officer (CEO), abandoned software development, and became a mere hardware provider. It surrendered its position as the leading smartphone provider and ultimately exited the mobile phone business.

Context

The mobile phone industry has grown rapidly during the past 20 years, and its trajectory has been divided into several distinct technological phases. By 2005, the industry was moving toward third-generation (3G) radio technologies that enabled faster Internet connections. In 2007, Apple introduced the iPhone, which lacked 3G support but still promised mobile Internet, in the eyes of the mass market, with its large touch screen and advanced user interface enabled by iOS, an exclusive operating system (OS) based on the OS Apple had been developing for years for its computers. This move was a major discontinuity for the whole industry: for the first time, differentiation lay in software rather than radio technology—see table 1 for key market events and changes in market shares. This shift presented a growth opportunity to companies such as Apple and Google, which were already strong in software development; other traditional players had to scramble to develop software capabilities that were radically new to them. Samsung, seemingly the only traditional player to prosper after the software revolution, chose to adopt Google's Linux-based Android OS (an open-source software). But Nokia, hoping to ensure sustainable profit, decided to continue improving its proprietary OS.

Top managers' belief that Nokia should remain autonomous in software terms was supported by its past achievements (Cord, 2014). Even its early phone models had software-enabled functions such as phone books and text messaging. By 2005, Nokia's primary smartphone OS was Symbian, which both internal and external developers generally described as difficult to work with. Additional complexity arose from Nokia's simultaneous development of Internet services to be integrated with Symbian. Nokia had also been exploring the use of Linux in mobile devices. The result, an OS named MeeGo, was intended to replace Symbian after several product generations. Nokia's top managers thus believed it had all the elements in place to develop good software and remain the leading smartphone provider. But consumers' responses to Nokia's phones became increasingly negative between 2008 and 2010 because the improvements in product quality seemed modest compared with challengers' offerings.

Data Collection

Our primary data came from private interviews conducted between November 2012 and February 2014. We carried out a total of 76 interviews with Nokia's top managers (TMs), middle managers (MMs), engineers, and external experts, as detailed in table 2. Consistent with Huy (2001, 2011), we defined MMs as

Table 1. Market Shares and Key Events in the Mobile Phone Sector (including Smartphones), 2007–2010*

Company	2007	2008	2009	2010
Nokia	38% (49%)	36% (41%)	36% (39%)	29% (34%)
Apple	x% (3%)	1% (7%)	2% (14%)	3% (16%)
Samsung	13% (x%)	15% (4%)	20% (4%)	18% (8%)
RIM (BlackBerry)	x% (10%)	2% (16%)	3% (21%)	3% (16%)
Sony Ericsson	9% (x%)	7% (3%)	5% (3%)	3% (3%)
Motorola	14% (x%)	8% (3%)	5% (4%)	2% (5%)
HTC	x% (3%)	1% (5%)	1% (5%)	2% (8%)
LG	7% (x%)	8% (2%)	10% (2%)	7% (2%)

Key market events during the year				
Apple announces (Jan.) and launches iPhone (2.5G radio technology) in the U.S. (June) and UK, France, and Germany (Nov.)	Apple launches iPhone 3G in 26 countries and AppStore (July)	Apple launches iPhone 3GS (June)	Apple launches iPhone 4 (June)	Samsung launches Galaxy S Android phone (June)
Nokia launches N95 smartphone (with 3G technology) in March	Nokia launches beta version of Ovi (Aug.)	Nokia launches N97 (June)	Samsung launches its first Android phone, Galaxy (June)	Nokia announces (April) and launches (Oct.) first high-end, touch-only phone to match iPhone (N8)
Nokia announces Ovi Internet store for software applications (Aug.)	Nokia launches its first touch-phone, 5800 (Oct.)	Google announces (Aug.) and releases (Oct.) Android Market	Google announces Android OS (Nov.)	
	First Android phone, HTC Dream, launched (Oct.)			
	Internet store			
	Nokia announces first "iPhone killer" N97 (QWERTY keyboard + touch screen) in Dec.			

* Data are presented as "all mobile phones (only smartphones)"; "x%" means that the market share was too small to be reported (i.e., included in the category "others"). Sources: <http://www.gartner.com/newsroom/id/612207>; Chaplinsky and Marston (2011); <http://www.gartner.com/newsroom/id/1543014>; <http://www.gartner.com/newsroom/id/910112>; http://www.quirksmode.org/blog/archives/2011/02/smartphone_sale.html.

those who were two levels below the CEO and one level above engineers and front-line workers. The interviews were carried out in three rounds, and we analyzed the data between each round to inform subsequent interviews. Several key informants who were closely involved with the mobile-phone business, including the CEO, vice presidents, R&D managers, and strategy directors, were interviewed multiple times.¹ We purposefully sampled the

¹ Nokia had two CEOs during the period of our study. When we speak of "the CEO," we refer to the second one, whose tenure as CEO lasted from 2006 to 2010. He worked in several executive positions at Nokia before becoming CEO. When we speak of "the chairman," we refer to the first CEO, whose tenure as CEO lasted from 1992 to 2006. He was chairman of the board from 1999 to 2012. While the chairman was less active in daily management from 2006 onward, we bring up his role because (1) our informants highlighted how his behaviors had shaped Nokia's culture, (2) he still exerted influence as chairman until the end of our study period, and (3) the dynamics that we describe in the findings had already started during his tenure as CEO.

Table 2. Informants and Interviews

Level	Person	1st round	2nd round	3rd round	Validated inductive model?*
0	Chief executive officer	1	1	3	yes
1	Executive vice president (EVP)			1	yes
1	Executive vice president			2	yes
1	Executive vice president†		1	1	(yes)
2	Technology officer			1	no
2	Senior vice president		1	2	yes
2	Senior vice president		1		–
2	Senior vice president			1	–
2	Senior vice president			1	–
3	Corporate vice president	1	1	1	yes
3	Vice president			1	yes
3	Design vice president			1	–
3	Product vice president		1	2	yes
3	Product vice president	1			–
3	Software vice president		1		–
3	Software vice president		1		–
3	Software vice president	1		1	yes
3	Software vice president			1	yes
4	Product unit (PU) directors (two individuals)	2	1	1	yes
4	Directors (three individuals)	3	1	1	yes
4	HR directors (two individuals)	1	2		–
4	Market intelligence director			1	yes
4	Software directors (eight individuals)	5	4	2	3 x yes 1 x no
4	Strategy directors (three individuals)	2	2	2	2 x yes
5	Radio engineers (four individuals)	4			–
5	Software manager		1		–
5	Strategy managers (four individuals)	2	3	2	yes
5	Supply-chain managers (two individuals)	2			–
X	Top-level consultants (three individuals)			3	2 x yes

* “–” means that we did not show the model to the individual due to timing (early stage of the study) or schedule (short interview).

† This EVP emailed us his/her thoughts multiple times and confirmed that top managers lacked understanding of technological capability, but his/her answers are not included in the count of interviews.

interviewees to get both top and middle managers’ descriptions and interpretations of how their interactions had unfolded and influenced organizational actions, as well as the perspectives of engineers. We contacted all of them personally and assured anonymity. An average interview lasted about 80 minutes. All the interviews were audio-recorded and transcribed, apart from seven for which careful notes were taken. Our interview protocol is shown in Online Appendix A (<http://asq.sagepub.com/supplemental>). We also conducted over 200 informal conversations and follow-up conversations with the interviewees and other Nokia informants.

As this is a retrospective field study, a particular concern was reducing the risk of ex-post rationalization. First, we asked various informants from multiple hierarchical levels to describe and interpret the same concrete events separately, which allowed us to validate the plausibility of their accounts. For

example, top managers told us they pressured middle managers for faster performance, and middle managers also told us how they felt pressured by top managers. Second, we relied on informants who were particularly knowledgeable about the relevant events and for whom the events were personally important, thus improving memory accuracy. Third, we used specific interview techniques such as precise "courtroom" questioning and event tracking, which provide accurate and convergent information among informants (Eisenhardt, 1989). We asked individuals to describe concrete examples and events, obliging them to rely on their episodic memory, which provides more comprehensive accounts (Tulving, 2002) and increases recall accuracy (cf. Fisher, Geiselman, and Amador, 1989; Miller, Cardinal, and Glick, 1997; Fisher, Ross, and Cahill, 2010). Episodic memories, which may rely on a separate memory system, complement more-generic recollections of mental states because they contain specific details of not only what was happening or felt but also exactly when and where (Tulving, 2002). In this way our data were triangulated, making them more trustworthy. For example, it is more comprehensive when a person remembers a specific instance of when and where he or she felt fear, rather than simply recalling having felt generally afraid in the past. Episodic memories may also be more reliable than retrospective survey measures because they do not oblige informants to select a discrete category to characterize their memory. We also asked informants to describe factual manifestations of mental states, which are more robust to retrospective biases than memories of mental states (e.g., Miller, Cardinal, and Glick, 1997). Fourth, we validated subjective accounts with factual and prospective sources when possible; we reviewed nearly 1,000 articles and books about Nokia, and several informants also shared confidential internal reports, presentation slides, e-mails, and notes that corroborated our findings.

Data Analysis

We used the method described by Gioia, Corley, and Hamilton (2013) to guide our data analysis. Novel understanding can often be gained by carefully investigating how various participants of an organizational process experience events, and the authors suggested some practices that bring "qualitative rigor." As is typical of inductive research, our analytical process was iterative and overlapped with data collection, but several phases can be recognized. During these phases, we developed increasingly refined inferences of novel theoretical mechanisms from our data.

We started with open coding (Strauss and Corbin, 1998), which included reading the interview transcripts and marking codes to describe the content of the interviews. We coded nearly 2,000 segments of data. The initial codes covered various topics, such as "MMs criticizing TMs for being 'lost'," but we also included emotion-related themes such as "perceived lack of emotionally appealing communication." We further categorized such first-order codes into more-abstract theoretical dimensions. We also wrote numerous memos during the process to develop theoretical insights.

As we iterated between coding and data, our theorizing evolved in four main steps: (1) Nokia's failure to innovate caused by TMs' inaccurate understanding

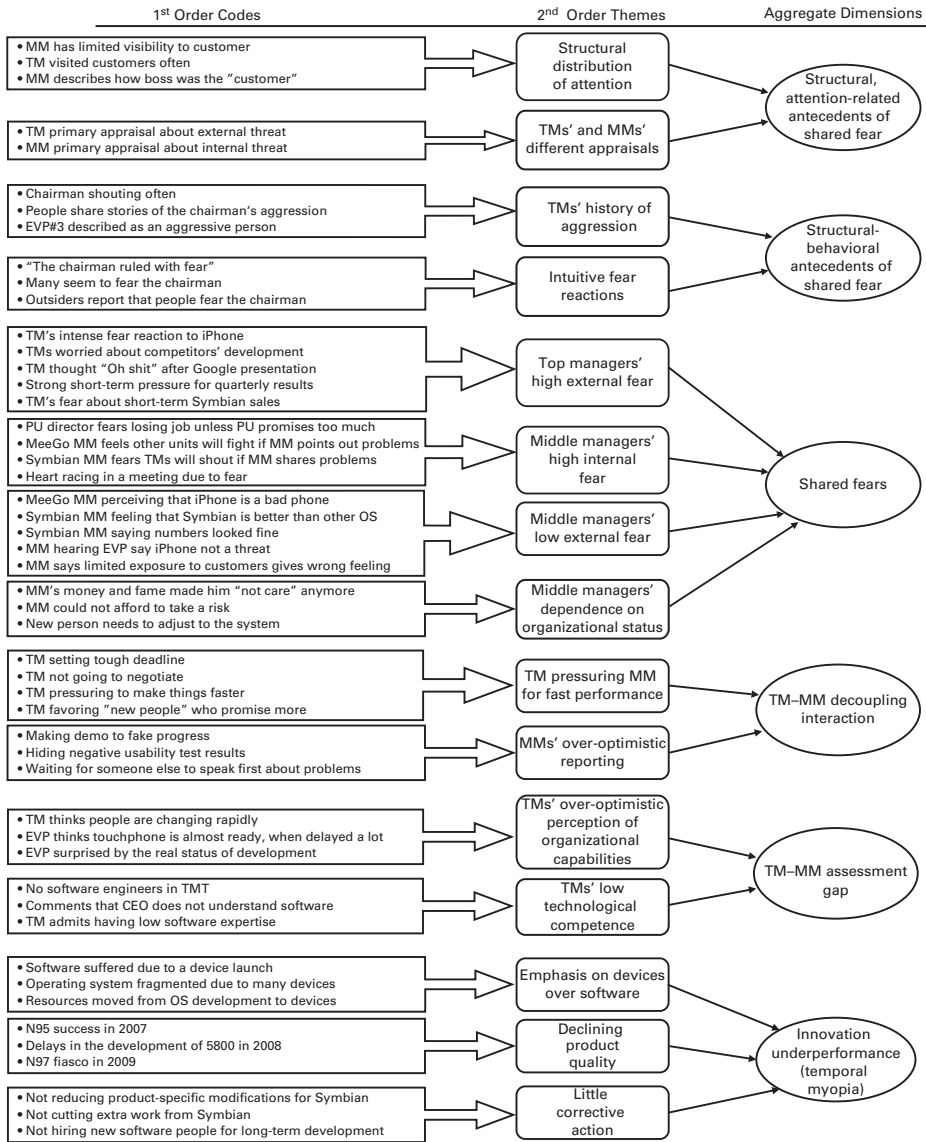
of capabilities; (2) Nokia's failure to adjust during the innovation process caused by inauthentic TM–MM interactions; (3) the interim outcome, temporal myopia—excessive focus on short-term innovation even though long-term activities might lead to more beneficial outcomes (Levinthal and March, 1993)—caused by TMs' externally focused fear and MMs' internally focused fear and low external fear; and (4) Nokia's attention structures that in part elicited such fears, which created decoupling interactions between TMs and MMs, causing temporal myopia.

We refined our coding procedures according to our evolving understanding (Strauss and Corbin, 1998). To code emotions more systematically, we used the appraisal theories of emotions (Lazarus, 1991; Ellsworth and Scherer, 2003; see also Huy, 2011; Huy, Corley, and Kraatz, 2014), which indicate that emotions result from specific appraisal processes and each basic emotion is associated with a prototypical appraisal pattern. For example, fear is elicited when people perceive potential harm in their relationship with their environment and consider their coping potential as low or uncertain. We thus inferred fear when people described their concern that undesirable things might happen to them—that is, uncertain future harm—and did not feel they had full control over the threat or the ability to eliminate it. In addition, the informants sometimes explicitly described various emotions they had felt, by using phrases such as "I was afraid that . . .," or they recalled physiological reactions such as shaking or a racing heartbeat and their context, which allowed us to infer specific emotions. When multiple informants described having experienced a similar emotion and/or reported that colleagues experienced the same emotional reaction associated with a similar appraisal, we inferred that shared emotions were present. Labeling emotions felt jointly but individually as "shared" is consistent with the way "shared" is used in research on shared mental models that uses a compositional view (see Kozlowski and Klein, 2000; Mathieu et al., 2000). Initially, we recognized a variety of emotions from the informants' accounts, but we ultimately focused on fear because it was the emotion most commonly described, and it explained most plausibly the key dynamics that we describe in our inductive model.

Beyond coding, we also used a practice similar to constant comparisons in grounded theory (Strauss and Corbin, 1998) to identify differences and similarities among various data segments. For example, by comparing an MM's fear accounts with those of other MMs, we could see that they had experienced similar emotions associated with similar appraisals, thus suggesting shared emotions. In addition, when MMs' expressed targets of fear differed from those of TMs, we ultimately inferred the difference between internally focused and externally focused fear and started to analyze their antecedents and consequences. This iterative process resulted in the data structure presented in figure 1, which shows how the theoretical concepts we developed are grounded in the empirical data.

We used a factual timeline of events, theoretical logic, and the informants' descriptions, which contained various events at different points in time and relationships between the events, to identify the temporal dynamic of our process model, i.e., reflecting how some factors influence subsequent factors over time. For example, we created several causal-loop diagrams to map the links between concepts that were abstracted from the data. Likewise, we

Figure 1. Code-aggregation diagram.



matched the informants' fear-related statements with their descriptions of TM–MM interactions through axial coding (Strauss and Corbin, 1998).

Checking the Model's Validity

We conducted a three-step member-check process to increase the validity of our inductive model (Shah and Corley, 2006). First, we presented the key elements of the model individually to 23 informants who were spread across different groups and functions. As shown in table 2, 21 of these informants, including TMs and software VPs and directors, concurred that our model accurately

described what had occurred at Nokia.² Second, we sent a four-page summary of our key findings to 331 TMs and MMs who worked for Nokia during our study period, with an invitation to send us feedback, “especially if you disagree with the findings.” We received 37 written responses, all but three confirming our key findings. Several MMs also shared additional examples of how they had felt fear or how fear had prevented them from reporting negative information to TMs, even when they knew it would have been the right thing to do. Third, we conducted 27 follow-up phone calls and face-to-face conversations during the revision process to double-check that our informants had indeed meant that they had felt fear as an emotion (as opposed to using “fear” as shorthand for a cognitive evaluation of a situation) when describing their own experiences and their interpretations of others’ experiences. Twenty-two (81 percent) of them confirmed that they had indeed meant the emotion fear and that this emotion had influenced their behavior. Hence Nokia informants overwhelmingly agreed with the key elements of the inductive model that we present below, in particular the role of externally focused and internally focused fear.

FINDINGS

Various types of fear experienced by Nokia’s TMs and MMs caused a decoupling interaction pattern between the two groups that harmed Nokia’s innovation process. Two factors influenced TMs’ and MMs’ fears: Nokia’s structural distribution of attention produced differences in appraisals and shared fears among TM and MM groups, and TMs’ past aggressive behaviors—and widely shared stories about them—triggered intuitive fear reactions in MMs because they had a lower position in the organizational hierarchy than TMs.

Structural, Attention-related Antecedents of Shared Fears

Structural distribution of attention. Nokia’s organizational structure included the division of labor between TMs and MMs such that the former had a focus on the external environment and the latter on the implementation of TMs’ directives (March and Simon, 1958; Joseph and Ocasio, 2012). TMs focused on the external environment through direct interaction with customers and competitors and also through staff channels (corporate market intelligence). A TM told us that he had plenty of interactions with customers, especially large network operators such as AT&T and France Telecom, and the CEO publicly admitted that he was “paranoid about all the competition” (MarketWatch, 2007).³ Nokia had clearly defined processes for managing

² We showed a late version of the figures in this paper and explained them, after which the informants were asked whether they felt the model was a reasonable description of what had happened at Nokia, in light of their own experiences. Twenty-one participants agreed with the model, and two expressed doubts: one who had a significant role in radio-technology development before 2007 and did not witness decoupling interactions between TMs and MMs in his or her area of activity, and one who claimed that Nokia did not have problems in software quality.

³ When we refer to the data from our private interviews, we have anonymized the individuals such that top managers (CEO and three executive vice presidents) are marked as TM, senior vice presidents and vice presidents as UMM#1...#N (upper middle managers), and directors and managers as MM#1...#N (middle managers). We also indicate the primary focus area of the individuals, such as “software,” with the quotes when this has theoretical relevance. When we use data from public sources, we refer to the actual titles of the people.

emerging strategic issues (e.g., Kajanto et al., 2004) and strategic agility (Doz and Kosonen, 2008), according to the CEO, even using “cultural anthropologists . . . to find out what’s important in people’s lives because everything changes so quickly” (Korn-Ferry Institute, 2010). Nokia’s active sensing of the market was manifest in its response to the iPhone threat about one year before its launch, which it knew about despite Apple’s famed secrecy. In other words, cognitive inertia (Fransman, 1994; Tripsas and Gavetti, 2000) cannot be seen as a plausible or sufficient explanation for Nokia’s failure. As members in senior strategic positions at Nokia revealed:

We knew [the iPhone] was coming out about a year in advance. We had pretty good specifications for it. . . . The first thing [a MM] flagged up [in a market review] was that we didn’t have touch screens or touch-screen development. . . . That message went right up to the top of the organization, and was well received too. [The CEO] forwarded [the] email to his subordinates. Our market analysis showed that our biggest competitive weakness was the lack of touch-screen products; he agreed, and wrote “Please take action on this.” (MM#1, business)

Confidential prospective documents that were shown to us confirmed that the TMs did indeed recognize this issue, gave it a high priority, and included it in their requests to MMs. UMM#1, who was working close to the CEO, likewise described how the CEO put clear pressure on MMs so that they would implement what he thought would be essential:

One of the first things [the CEO] brought up was the touch screen. . . . He felt it was the next big thing . . . He brought it up with the executive group every way he could. And he spoke directly with technical middle management. . . . In every single executive-group meeting, they went over our outlook with the touch screen. And this was right after he was made CEO [a year before iPhone launch] . . . I recall many such cases vividly, where he brought up the right concern [what Nokia should do], he discussed it directly with the technical middle and upper management, he went straight to the topic, put pressure on people, put it up in all possible goals [for MMs], followed up on it in every single meeting.

A TM further elaborated in a private interview with us that he saw it as TMs’ task to translate market expectations into clear goals for the organization: “The tight schedule and challenges come from the markets. They put time pressure on you, and you need to pass it on to the organization.” Given that Nokia failed to develop an innovative offering to match the iPhone, despite TMs’ intentions and directives, we need to better understand how the implementation process unfolded within Nokia’s structural and historical context.

MMs’ focus of attention was predominantly on the implementation of TMs’ orders rather than the external environment and was split between two key groups: product units (PUs) in charge of defining specific products and software units in charge of developing Nokia’s two OSs, Symbian and MeeGo, and modifying them to meet the needs of specific phone models based on requests from the PUs. Although the primary communication channel flowed from TMs to PUs to software units, the software units also had direct interactions with TMs, both formally and informally. This suggests that a purely structural explanation—lack of opportunities for interaction (cf. Henderson and Clark, 1990; Ocasio, 1997)—does not explain the assessment gap between TMs and

software MMs that we describe below. The PUs' attention was focused on TMs' requests and narrow market segments corresponding to the specific products they were developing. Nokia had five PUs, each responsible for a specific market segment such as music phones. Within each unit, there were several programs, such that Nokia had "40 to 50 product programs per year" (UMM#2), and program leaders were tasked with implementing their respective programs. Each PU focused on delivering phones as directed by TMs. The key aspects that TMs emphasized for PUs were product segmentation, cost, and schedule. The software units' attention was focused on satisfying both TMs' and PUs' requests. As our informants related:

The pressure was not personified in any one [person], but came from the whole executive group. . . . For me personally and my team, the pressure was the message that "we need these phones, we need those phones, we have to have releases in such and such a time." (UMM#3, software)

Those [key technological decisions] were all taken to the executive group and they approved the technical choices. . . . It was like the TMs told us that "now we're using [specific software], end of discussion, this is what we'll do." . . . Each morning we had a new strategy and each morning there was a new angle. It was very much dependent on what someone had said to [EVP in charge of the unit] on the previous day—that was the new direction. (UMM#4, software)

Even in the early 2000s, the sales organization had already been changed such that the link to the customer was rather unclear. . . . There was a layer between the customer and the units developing the software. . . . This blocked transparency and also motivation. (MM#7, software)

Organizational norms—an element of attention structures (Ocasio, 1997)—also intensified MMs' internal focus. Nokia's TMs believed that MMs' narrow internal focus would ensure effective implementation, and therefore they discouraged MMs' external focus. For example, after Apple had introduced the iPhone, the CEO said publicly, "I don't think that what we have seen so far (from Apple) is something that would any way necessitate us changing our thinking" (IntoMobile, 2007). Likewise, when MMs asked critical questions, the TMs urged them to keep their attention focused on implementing their tasks: ". . . the answer typically was that 'this is the direction we have chosen. Don't challenge me, but focus on implementation'" (MM#2).

TMs' and MMs' different appraisals. As a result of the structural distribution of attention, different appraisals generated different emotional reactions among TMs and MMs. Whereas the TMs' appraisals of the person–environment relationship focused on the external environment, MMs' appraisals mainly focused on factors inside Nokia. TMs recognized early on that external conditions beyond Nokia's control threatened its survival. As one of them described:

[In 2007], Sergey Brin, one of the founders of Google, took something out of his pocket that I'd learned to call a "smartphone." He put it on the desk, then he pulled out another, and a third. Then he turned to the audience and said, "In two or three years' time, these displays"—that's what he called them—"won't add any value. All the value will be in the cloud, and these displays will just be a window on the cloud."

I'm looking at him and I'm smiling, of course—there were 500 people watching. But I'm thinking, "Oh shit!" because he was spelling out Google's strategy: make the smartphone less value-adding and move the intelligence to the cloud [which would make Nokia irrelevant as its core business was making "these displays"].

In contrast, MMs' appraisals focused on threats perceived inside Nokia. Though PUs also made sense of their respective narrow market segments, their appraisals often focused on what TMs wanted from them. These appraisals included a perception of potential harm to their well-being and uncertainty over their ability to cope with it. For example, an MM from a PU (MM#3) told us: "The people who told the truth [about the feasibility of schedules put] their reputations on the line. They ran that risk." Similarly, the focus of software MMs' appraisals was on the threats and uncertainty relating to TMs' requests. UMM#5 noted that "if you did not comply [with TMs' unreasonable request to maintain a steady pace despite mounting technical challenges], you would be labeled as a loser." In addition, Nokia's tendency to change its organizational structures frequently to ensure effective resource allocation made MMs in both PUs and the software organizations perceive heightened threats to their well-being inside the organization (a primary appraisal of fear) and low ability to cope with such uncertainty (a secondary appraisal).⁴ As a software MM told us: "Reorganizations were difficult. People had to reapply for their jobs at Nokia. . . . I sent my application. Then you got an invitation to an interview It was quite tough. . . . At that point, you started to wonder whether you were working at Nokia or not. I felt like I wasn't—I didn't have a job or a position" (MM#4, software). Conversely, we found very little evidence of MMs' threat-related appraisals related to the external environment beyond PUs' considerations of how well a specific product would sell in its segment. Our informants described very few appraisals related to the external environment:

Our view of our competitors' products' usage was completely distorted in 2005–2008. People didn't know how good Android was, or the iPhone. . . . So, a certain small group knew, but it wasn't known throughout the company how good the competitors' products are becoming. The group of people who really knew the pain was way too small. (MM#3)

Structural–Behavioral Antecedents of Shared Fear

TMs' history of aggression. A second factor that triggered fear among Nokia's MMs was its TMs' history of aggressive behaviors toward MMs, which was widely known inside the organization. When conducting our interviews, we were struck by how often informants referred to the aggressive behavior of Nokia's chairman, who was also the CEO from 1992 to 2006. He was described as "extremely temperamental" (UMM#6) and shouting at people "at the top of his lungs" (top-level strategy consultant) "so hard that [the target's] balls shrank . . . in front of 15 other VPs and SVPs" (MM#5, software). Thus "it was very difficult to tell him things he didn't want to hear" (top-level HR consultant). Our informants also described several other TMs as highly aggressive. UMM#7 told how one of the EVPs once "pounded the table so hard that

⁴ Structural changes included both major ones (2004 and 2008) and more minor ones, such as establishing new teams and units and rotating people in different roles, which happened yearly.

pieces of fruit went flying,” and MM#6 said the same EVP “had nothing but poison running through his veins.”

MMs’ intuitive fear reactions. Research suggests that aggressiveness often automatically triggers fear in social situations (e.g., Hareli and Rafaeli, 2008), especially when the aggressor has a higher status than the target of the aggression (e.g., van Kleef, De Dreu, and Manstead, 2004); that emotions can become associated with the places where they have been felt (such as meeting rooms with TMs) (Damasio, 2003: chap. 2); and that hearing stories of others’ previous aversive experiences with their leaders can intuitively activate fear toward authority figures (Kish-Gephart et al., 2009). Most of our informants reported having experienced or heard stories of the chairman or other Nokia TMs behaving aggressively, and thus intuitive fear of TMs seems to have gripped Nokia’s MMs:

[The chairman] had the habit that if someone said that “things aren’t going so well,” then after that the person would be doing very poorly. [The chairman] had a distinctive style so that everyone had to tell him that things were going very well. (MM#7, software)

[The chairman] was very cold and it seemed to me that many Nokians feared him. (Reporter close to Nokia)

The atmosphere of fear was created through speech. The worst one was the presentation that [the chairman] gave at Tampere [a city in Finland] about R&D expenses. . . . He said that his only mistake had been to give us too much money, and that despite that, our products still weren’t good enough, and we weren’t making them fast enough. On top of that, he said that if things continued as they were, 15% of the people in that seminar hall would be gone by the time he came back next year. . . . This was my first encounter with [the chairman], and it left a permanent negative feeling. (MM#4, software)

One TM noted that “[MMs who interacted with me] were nervous. . . . certainly you could sense . . . people’s natural fear of their lord and master.” But he also admitted that he had not adequately realized the implications of MMs’ fear. The aggressive behaviors of the chairman and some EVPs activated a generic fear toward authority figures at Nokia, in particular all powerful TMs.

Shared Fears

In contrast to conventional accounts (e.g., Henderson and Clark, 1990; Ocasio, 1997; Eggers and Kaplan, 2013) that depict engineers and managers as relatively unemotional, our informants described having felt strong emotions. Nokia’s TMs felt high external fear triggered by sources outside the organization such as competitors and shareholders, whereas MMs mainly experienced little external fear and high internal fear triggered by sources inside the firm such as superiors and peers. Our informants described experiencing fear of the same targets repeatedly—when the targets were encountered, recalled, or imagined—rather than feeling fear continuously. These fears had largely a structural rather than personal origin, meaning they were related to the focal groups’ formal position in the organizational structure. We describe these various fears below and present additional data in Online Appendix B, table B1.

TMs' high external fear. Nokia's TMs experienced high fear toward external entities in regard to both the long- and short-term survival of the organization. One described an intense fear reaction relating to long-term survival when reacting to news of the iPhone: "When [internal market intelligence] news of the iPhone arrived [in fall 2005], I asked which OS they were using. When I found out it was iOS, it made my hair stand on end. iOS was a bombshell. . . . It was shocking news. . . . iPhone was an extension of Mac—a Mac computer with radio added. They'd been building the applications and the OS for 35 or 40 years" (TM). A second TM confirmed, "I do identify with your statement that the top management felt external fear," and a third one validated that TMs experienced shared fear for the long-term well-being of their firm. In the short term, TMs' shared fear was related to the threat of cannibalization of Nokia's current OS, Symbian. If the firm did not keep posting strong quarterly sales, the board of directors and financial markets might punish TMs. As a TM said, "Management is under huge pressure from investors. . . . If you don't hit your quarterly targets, you're going to be a former [executive] very fast." Though TMs knew Nokia needed a better OS (MeeGo) to match iOS, they also knew that developing it would take several years. But they were afraid that publicly acknowledging Symbian's inferiority to iOS would torpedo sales figures and shatter internal morale in the short term:

I couldn't say [publicly] that Symbian was no good and that we had to replace it with MeeGo as soon as possible, because I was afraid of the [negative effect on] Symbian sales. . . . Our organization had to have faith in it—you must believe in the gun you're holding, because there's nothing else. It takes years to make a new OS. That's why we had to keep the faith with Symbian. (TM)

MMs' high internal fear. Most of the MMs we interviewed or spoke with informally admitted that they had feared their superiors. MM#3 told us that "they were rather scary moments when you had to go against [TMs]," and software MM#8 told us, "I felt fear," and indicated that the target of his fear was TMs. Another informant said that shared fear among MMs toward TMs "describes the company very well" (MM#9, software). Some informants expressed manifestations of internal fear, such as MM#4 (software) who, when reporting fear of his superiors during vertical interactions, wailed loudly, almost breaking into tears.

Nokia MMs also seemed aware of the fear felt by their colleagues; many described not only their personal fears but also the tendency of many individuals to feel a similar fear (i.e., shared fear). MM#10 told us how "the atmosphere of fear emerged" in Nokia, and MM#11 described shared fear using the metaphor of a highly feared, dictatorial national leader: "General sentiment and communication ended up like North Korea." Software MM#7 noted that MMs in general "were afraid of being caught." Some informants also remembered specific occasions when they could infer their colleagues' fear from observable cues or when they and their colleagues had spoken explicitly about fear. For example, software MM#12 told us that his colleague "was typically open and clear, but in certain meetings [with higher-level leaders], he became very quiet and when he spoke his voice was shaking." Software MM#7 said he had suggested criticizing a TM's decision, but his colleague "said that he didn't have

the courage; he had a family and small children.” MM#13 explained that an R&D MM had perceived that his superior was afraid of TMs; the R&D MM approached MM#13 privately after a meeting and complained: “[My boss in R&D] has got no balls. He won’t push this [technological issue] upstairs.” Software MM#8 said he and his colleague once discussed their shared fear toward TMs in a private gathering at a Helsinki bar, and MM#14 said she had multiple conversations about “reduced trust and higher worries and fear with my colleagues since the late nineties.”

As well as fearing their superiors, many MMs described feeling afraid of their colleagues in other units:

In those forums, there was no way you would accuse someone of not telling the truth. [Culturally, it was not acceptable to] criticize someone else’s story in any way. . . . No one wanted to fight their battles in front of [the CEO] and others, because you knew that if you put someone [else] down, they’d put you down the first chance they got. (UMM#8, software)

I should’ve been much, much more courageous. And I should’ve made a lot more noise, should’ve criticized people more directly. . . . I could’ve made more of an impact. And it would’ve been breaking the consensus atmosphere. . . . Nobody wanted to rock the boat, especially [among] the middle management [level]. . . . I didn’t want to be labeled as a mean person who was constantly criticizing the hard work of others. . . . I should have been braver about rattling people’s cages. (MM#1)

Beyond the key antecedents of fear described above, another reason for MMs’ fear toward their colleagues was that many MMs perceived that other MMs’ behaviors were self-centered and dysfunctional, using descriptions such as “focused only on self-interest and own career development” or “deceptive.” The MMs we interviewed further described how they felt threatened by these behaviors because they might harm the status and career progression of more-authentic individuals. These reactions seem consistent with earlier research showing that perceptions of political behaviors generate primary appraisals of threat that elicit negative emotional states (e.g., Chang, Rosen, and Levy, 2009).

Prospective documentary data provided corroborating evidence of internal fear at Nokia. In a book written in 2008, a former Nokian described Nokia’s “atmosphere of fear” (Palmu-Joronen, 2009: 12). A news article from 2007 was entitled “Fear is driving Nokians to unionize” and described individuals’ fear of losing their jobs or being exploited (*Taloussanomat*, 2007a). A consultant’s report in 2007 (mentioned by the EVP of HR in *Taloussanomat*, 2007b) and a book written in 2009 by a former software and design director (Risku, 2010: 38, 61) both noted that a lack of courage was a particular problem at Nokia. Two Nokians’ personal notes written between 2005 and 2007 directly indicated that they had perceived others feeling fear; one indicated that he had personally felt fear. Several blog posts and online discussions that included Nokia MMs, IT professionals, and other observers close to Nokia also included statements that described or indicated fear (Finnsanity, 2007; Uusisuomi, 2008; Jarmostoor, 2009). Two confidential reports written near the end of our study period also indirectly indicated that MMs might feel fear toward TMs.

There were also several reports in the Finnish media in 2008 about a rumor that Nokia was threatening to relocate its headquarters from Finland if a law

that would allow companies to read their employees' e-mails was not passed (Wikipedia, 2015). The law became known as "Lex Nokia" (*The Register*, 2009). For many of our informants, this law symbolized the atmosphere of fear at Nokia (see also Murobbs, 2006, for related online discussions by Finnish IT professionals). Our informants also consistently noted that "no one was stupid enough" (MM#15, software) to mention their true feelings in e-mails because they suspected that the company was monitoring them.

MMs' low external fear. Threat-rigidity theory would predict that when a competitor poses a threat, the whole organization responds to it with emotional arousal (cf. Staw, Sandelands, and Dutton, 1981). This did not happen at Nokia. Although they deeply feared internal entities, most Nokia MMs experienced only modest external fear. A senior strategy consultant explained that Nokia's MMs had little external fear that other firms were better because they believed Nokia had superior capabilities relative to other organizations:

They [Nokia MMs] were overconfident in their own abilities. From a consultant's point of view, it showed in how they treated [the consultant], whatever function you went into Nokia . . . to talk about, like, "Hey, have you thought about this issue like this?" Nokia has always been one of the most arrogant companies ever towards my colleagues, who were partners back then. It showed up in how everything was always perfect, you know, Nokians [thought that they] were the best in class. And they didn't even want to hear how you could think about things differently. They just went into their cocoon and patted themselves on the back.

Software UMM#8 noted, retrospectively: "[TMs] should have created healthy dissatisfaction among people a lot faster." As MMs' attention was focused on intra-organizational factors, the manner in which they assessed competitors' products seemed biased by what was perceived as relevant for Nokia. MMs downplayed the competitive gap by comparing Nokia's future developments against competitors' past products: "[Competitors' products] were always compared to what we knew that we were doing next. There was not much to learn from. . . . In comparison to our [future products] they were no better" (MM#16). Many MMs also made comparisons along dimensions that favored Nokia's products. For example, several MMs told us they had felt that "the iPhone was a bad phone; it didn't even have 3G [radio technology]" (UMM#3, software). Some wondered whether "Apple paid magazine editors to sex up the iPhone in their fawning articles" because "they believed [that the iPhone hype] was undeserved, irrational" (Cord, 2014: 86). These quotes indicate that many Nokia MMs genuinely believed that their products were superior to Apple's.

MMs remained aware of the macro measures of their company's performance, but these measures—which again reflected the past rather than the present—also suggested that there was "nothing to worry about" (MM#3). As quarterly evaluations by the stock market were important for Nokia, positive market news strongly influenced MMs' appraisals of external competition and calmed their external fears. As UMM#7 noted, "[We sold] the classic smartphones with old-fashioned keyboards in such goddamn huge numbers that some people questioned why we should even make touch-screen phones—'we're doing fine as it is.'"

TMs' actions also contributed to MMs' low external fear. TMs' public rhetoric downplayed the threat of new entrants, including Apple and Google, to maintain confidence among employees and customers that Nokia would continue to prosper. For example, the CEO downplayed Google's Android strategy publicly in November 2008: "We have had that [platform and applications] for 10 years. Definitely, we are ahead" (Symbian-Freak, 2008). Likewise, an EVP stated publicly that the iPhone is "an interesting product but it is lacking a few essential features, such as 3G, which would enable fast data connections" (*Taloussanomati*, 2007c).⁵

MMs' dependence on organizational status. In addition to the primary antecedents of shared internal fear described above, many MMs' dependence on high status inside the organization amplified the influence of those primary antecedents on MMs' internal fear. Not surprisingly, many MMs attached high importance to their social status inside Nokia and thus perceived negative reactions from colleagues as personal threats. In addition, as many MMs lived in Finland, home to few globally successful high-tech companies, they could see no better job opportunity than being part of the industry world leader. Working for Nokia conferred a prestigious external reputation or image. As our informants explained:

[Many people change jobs to advance in their careers, but] if you've been with Nokia, especially as the level of SVP, VP, or even a director, where the hell are you going, really? You're going nowhere, so you circle around within the company. Unless you're willing to move to the US or Asia, you have no [better] job opportunities. (Senior strategy consultant)

[Nokia's status was so high that] if you had a Nokia business card, you could get a meeting with any CEO. Any CEO. . . . Everyone had good jobs; no one wanted to leave Nokia at that point. . . . Critique [of the company] was seen as negative; the mindset was that if you criticize what's being done, then you're not genuinely committed to it. (MM#17)

For most MMs, Nokia membership was a central contributing factor to their personal status. But for a few other MMs, being part of Nokia was deemed less important. These rare MMs had already accumulated sufficient personal achievements and material resources to have a sense of individual autonomy and self-worth beyond what could be conferred by their organizational membership. They also experienced lower internal fear than their peers. For example, one software leader who had worked at Nokia for over 15 years, made

⁵ A fourth reason behind MMs' low external fear might have been their beliefs about their own superiority relative to the members of other organizations (cf. Hiller and Hambrick, 2005; Chatterjee and Hambrick, 2007). Even though our interview data did not directly indicate that Nokia MMs had these beliefs, two contextual factors could plausibly produce them (cf. Hayward and Hambrick, 1997). First, Nokia was for a long time among the most desired employers in Finland and therefore recruited only the "best of the best," making it possible that Nokians saw themselves as superior to others. Second, Nokia's long success and market power may have made others flatter Nokians in both business and private settings, reinforcing Nokians' belief that they were better than others. Note that we refer to MMs perceiving Nokia as a collective to be superior relative to other organizations but not to how individual MMs saw themselves relative to other MMs or TMs inside Nokia, who shared the same positive reinforcement from the outside and were also among the best of the best.

groundbreaking innovations, and earned millions of euros was one of this select group. He was described by several informants as very direct in confronting TMs, and our interview with him confirmed this perception. But he was “completely sidelined” (UMM#6), and his views—as well as the views of the few other critical MMs—were dismissed during collective interaction processes. Table B2 in Online Appendix B provides additional examples of individuals who were part of this critical group and how their views were dismissed. The table also includes more typical examples of MMs who had low to medium personal achievement at Nokia and felt high internal fear.

TM–MM Decoupling Interactions

In combination, TMs’ external fear and MMs’ internal fear and low external fear produced an interaction pattern between these groups that increased the decoupling between TMs’ and MMs’ perceptions of how quickly Nokia could develop new software and introduce smartphones to match the iPhone. During these interactions, TMs, driven by external fear, exerted heavy pressure and imposed challenging demands on MMs. This pressure came over and above the high internal fear that MMs were already experiencing. Instead of pushing back, MMs generally acquiesced to TMs’ demands and continued reporting optimistic progress despite mounting implementation difficulties. Online Appendix table B3 provides additional data on these interactions.

TMs’ increasing pressure on MMs for fast performance. Based on the extant literature, we might expect top-level executives to appreciate the technological complexity involved in innovation processes (cf. Kaplan and Tripsas, 2008; Dougherty and Dunne, 2012) and therefore to be careful not to let their own impatience compromise product quality (cf. Brown and Eisenhardt, 1997). But at Nokia we found the opposite pattern, which arose because a previously unacknowledged factor—shared external fear—influenced TMs’ behaviors. Fearful that Nokia would lose its world dominance and post weak results in the next quarter, TMs tended to act urgently, an action tendency associated with fear (Lazarus, 1991), and put high pressure on product and software units to develop new, innovative products rapidly.

First, TMs put direct pressure on MMs to perform faster. One TM noted, “It was clear that we [TMs] feared the iPhone. So we told the middle managers that they had to deliver touch-phones quickly.” Another TM said, “The pressure we put on the [Symbian] software organization was insane, because the commercial realities were also pressing. You must have something to sell. And of course, when the pressure is on the R&D teams, really intensely, of course they feel that they don’t have enough time.” A high-level leader from the MeeGo organization also reflected:

We spoke of a delay of at least six months, if not a year. We talked about it, it was brought up . . . [but TMs] just said “let’s go, you just have to run faster, we have to do this.” . . . They said [some short-term commitments] mustn’t delay us, but we still had to meet them. They probably didn’t realize that every time they asked us to do something, someone actually had to do it.

Beyond the verbal exhortations, TMs also applied pressure for faster performance by MMs through personnel selection. Although many MMs in the software groups accepted TMs' requests, a few did push back, as Online Appendix table B2 shows. Predictably but not ideally, TMs favored MMs who provided reassuring reports, thus temporarily alleviating TMs' external fear, and sanctioned MMs whose accounts validated TMs' external fear:

Question: Why didn't you explain to TMs that software development would be compromised if you had to develop as many phones in the given time period as the TMs wanted?

UMM#9, software: Someone else always said yes [to unfeasible TM demands]. All I got was the information—that's how it was. And then my responsibilities were cut. Because there was always some lunatic who promised they'd do all these ten fine and wonderful things within the timeframe given by TMs . . . even though it wasn't true at all [that it would be possible]. . . . TMs trusted these people when they said it's going to work out. They had blind faith. The management team . . . knew a lot of people—but they picked some young, fast-talking guy who said, "I have this little trick, I'll fix this thing."

Nokia TMs further sated their appetite for optimistic news by favoring "new blood" who displayed a "can-do" attitude. TMs confirmed that they had stressed the need for new, typically younger staff, whom TMs perceived as having the new skills and motivation needed to develop Nokia's capability. A TM told us that he "kept saying that we need new people," and another TM added:

Some people can explain things more clearly, like "this is what we should be doing." And others seem indecisive and talk nonsense. And then there's the plus that someone had a clear plan that these things should be done. Of course you listen to those people more, especially in a crisis, than to people who theorize issues endlessly. It comes down to action in the end.

As longer organizational tenure was typically associated with lower internal fear, however, Nokia TMs inadvertently paid less attention to MMs who had lower internal fears and were thus more honest about organizational limitations and proposed action plans that were less simplistic and less ambitious. TMs' external fear might have led them to perceive MMs who reported problems as pessimists or naysayers and thus to discount their warnings.

MMs' over-optimistic reporting. Based on the extant literature, we might expect that if TMs issued suboptimal directives because they lacked operational knowledge, MMs would help TMs improve their decisions through joint sensemaking (e.g., Joseph and Ocasio, 2012). This did not happen at Nokia. Instead, MMs' internal fear made them promise to deliver what TMs were requesting, even though they privately doubted the feasibility of TMs' requests. Though political perspectives might describe such behaviors as calculated cognitive approaches for gaining power (e.g., Pfeffer, 1981), our analysis reveals an alternative or complementary explanatory mechanism: MMs reacted emotionally in particular situations as fear drove them to make over-optimistic promises and reports. These empty promises brought short-term emotional relief to both MMs and TMs: MMs did not have to admit their limitations and risk

sanctions in the short term, while TMs' fear of losing to external competition was allayed. In addition, low external fear convinced MMs that there was little need to have a difficult debate with TMs about a non-critical issue. Thanks to MMs' submissive stance and over-optimistic reporting, TMs developed the perception that their ambitious requests were feasible and the company's long-term development was viable.

MMs in product units explained to us how they behaved in situations that triggered fear for their own well-being and access to resources inside Nokia:

[A central factor influencing whose proposal got resources was] the timeframe—how long it took [to develop the product]. You can get the resources by promising something earlier, or promising a lot. It's sales work really, you make an offer [TMs] can't refuse. It's a challenge to get resources if there are competing teams, so [you oversell]. When you promised something, the most important thing was the momentary fulfillment of needs; saying "yes" here and now. The benefit of doing that was so much greater than saying "it can't be done"—[even if you were] right. (MM#3)

The message about each product area had to be kept positive so [the units] would be allowed to continue [to operate]. If the message was that this hasn't progressed with these resources, [MMs] would be afraid that [their project] would be discontinued. . . . One source of fear was that many good projects had been discontinued. It was known [throughout the company] that Nokia had discontinued many good product concepts that could have been successful—for one reason or another. (MM#16)

Some MMs also described how intense internal fear silenced them during review meetings: "I remember one meeting where they had an insanely optimistic deadline for one subproject that was critical for [the whole product]. . . . I thought I should point it out, but the thought of challenging [TMs] made my heart race, and then I just kept quiet" (MM#8).

MMs in the Symbian software organization felt pressure from both TMs and product unit directors. Fear made them agree to TMs' demands, even when they did not believe they could be met. The typical interaction sequence was as follows: MMs voiced their concerns, TMs continued putting pressure on them, and MMs complied:

The software people tried to say that things weren't going so well, but the pressure to give the "right" answer [e.g., the next software version would be ready by a given date] to top management was high. Concerns were ignored during the conversation. The interaction was fragmented. If you were too negative, it would be your head on the block. If you said something couldn't be done, then it's about whether we should replace you. (TM)

They [higher level MMs in charge of specific aspects of software] accepted interface concepts as targets [as requested by TM] without going over whether it could be done and how fast. They accepted the concept and set the target that it'd be in stores within a certain time, so it was "go for it"—and then the guys started thinking about how they're gonna build it. (MM#18, software)

They [TMs] thought that if they just put pressure on the product-development organization, they would execute it. So maybe the product-development area should have been more assertive and said, "What you're asking for is impossible." . . . In product development, people didn't have the courage to say, "Listen, it's like this. We can't give you anything more." In Nokia's R&D, the culture was such that they wanted to please the upper levels. They wanted to give them good news . . . not a reality check.

There was a lot of top-down guidance. We'd be showing a schedule, then when we talked to middle management, we'd ask, "Why did you promise that? Why did you say yes?" "Well, because it will be a hassle if we say it's late . . . we can't say that." We needed a truth commission so people could tell them things without the fear of punishment, to say what was really going on. (UMM#7)

When problems started appearing, MMs did not inform TMs of potential delays or missing product features. Fearing TMs' immediate negative reactions, they remained silent or filtered information:

[In our unit] we wouldn't say anything about this [anticipated delay to TMs] because we thought that [another unit] was going to slip first. So we'd let them slip first, and then we could say, "Oh well, in that case we'll take an extra six weeks." So there was an element of brinkmanship and trying not to be . . . the one to slip first. (UMM#10, software)

The information flowed downwards, but the information did not flow upwards. Top management was directly lied to. They were misled. I remember examples when you had a chart, and the supervisor told [you] to move the data points to the right [to give a better impression]. Then you did that and your supervisor went to present it to the higher-level executives. There were situations where everybody [on our level] knew things were going wrong, but we were thinking, "Why tell TMs about this? It won't make things any better." We discussed this kind of choice openly. And it was possible to give them embellished reports because they did not understand the software. (MM#19)

MM informants also reflected how their behavior had been driven by fear rather than cold, affect-neutral self-interest calculation:

Question: Would you say that this [not telling about problems] was because of pure cognitive self-interest calculation?

MM#12: No. . . . I knew that it would hit me harder later. I knew it would be better to talk about it early. But I couldn't make myself do it. . . . It was like going to the dentist; you know that the situation is only going to get worse, but you still postpone it. . . . I think it was fear.

Question: When people gave optimistic promises, do you think they did it calculatingly, out of political self-interest, or was it an emotional reaction?

MM#13: In those situations, there were lots of people talking in a meeting and things moved really quickly. You just went with your gut. It's very complex. You can't work out how each and every person will react, and weigh up what would be best for you in the long run. It's more based on feeling.

TM-MM Assessment Gap

As a result of decoupling interactions between TMs and MMs, an assessment gap between the two groups arose. TMs' perceptions of what Nokia would be capable of doing differed substantially from MMs' perceptions, which in retrospect were closer to reality. Table B4 in the Online Appendix provides additional data demonstrating the assessment gap.

TMs' over-optimistic capability perception. TMs relied heavily on reports from various MM groups to stay updated on the speed of development of the

OS software. Even though Nokia's TMs had an accurate understanding of the market needs, their interactions with MMs gave them an over-optimistic understanding of Nokia's capabilities. As Nokia TMs noted:

I only realized [I was getting filtered reports] later on. There was a change in the business environment: we got rid of the hardware competitors and had software and internet competitors instead. But our organization's area of expertise was [not in these new areas]. People [in Nokia] learned to speak the [new technical] language quickly; they became quasi-experts. They gave the impression that they understood [this new area], but [I realized later] it was only skin deep. I was too ready to believe that these people could change. (TM)

The products were always late, but they were never late in [reporting] conversations. They came out one or two years late, but in conversations it was always that [our smart] phone would be ready in one or two months. And because it was said that it would be ready in one to two months, you never initiated bigger improvements that would have required six months. That would have created a long delay based on the understanding that prevailed then. You always imagined that the products would come out soon. (Another TM)

Beyond noting that MMs' communication was positively biased, Nokia's TMs also reflected that their own emotional states might have influenced how they interpreted signals from MMs and contributed to the emergence of their over-optimistic capability perception:

Making a big change takes such a long time that you don't want to believe it. . . . This is related to admitting things to yourself. So even if you understood on an intellectual level, you still won't accept it. . . . No matter what level you were at—employee, supervisor, middle or top management—it's extremely difficult to truly accept [that you cannot fix Symbian rapidly], even though you might understand it intellectually. (TM)

One reason we believed we could [develop software capabilities and smartphones as described by some MMs] was that the alternative [scenario was] horrible. The alternative, which Nokia [was forced] to adopt later, was to focus only on hardware and buy the software outside. [We would become] a pure hardware manufacturer. (Another TM)

Because TMs had an over-optimistic perception of capability development, they continued pressuring MMs to work faster because of their external fear of competition. A vicious cycle leading to declining product quality arose. Pressure from TMs hurt long-term OS software development by forcing MMs to take short cuts, and it amplified MMs' internal fear, which made them submit over-optimistic reports, maintaining TMs' over-optimistic perception.

TMs' low technological competence. Because organizations often hire outside executives from unrelated industries (e.g., *Forbes*, 2009), and most cognition research focuses on TMs' perceptions of external market needs (e.g., Eggers and Kaplan, 2013), one might expect that deep technological knowledge is not critical for top-level executives' effectiveness. Our data suggest the opposite: TMs' low technological competence made them more dependent on MMs' communication and thus amplified the effects of the fear-based communication on TMs' perception of organizational capability. When MMs showed them

technological demos or early prototypes, TMs were not able to directly assess what progress was truly being made and had to rely on what MMs reported: "A sufficiently competent guy can just look at the phone and how it works and see what's still to be done. Just by looking and testing it, [he knows] what's going on. But if you don't have a technical background, you just can't understand; you can't get it" (MM#18, software). TMs' low technological competence also influenced how they could assess technological limitations during goal setting, particularly in the absence of critical feedback from technological MMs:

If you consider Apple, the TMs are engineers. They tried to recruit [a senior Nokian] to Apple. He came back from having met Jobs and everyone and he said, "Nokia is business-case driven. We make everything into a business case and use figures to prove what's good, whereas Apple is engineer-driven. It was pure technology and the top management was immersed in the technology." That's often how it is in a product company, you have to understand how the product is built. . . . You have to make a lot of product decisions based on what's possible and what's not. Of course you must have stretching goals, but just deciding to build a product [will not work]. (UMM#7)

Nokia's TMs also admitted that, as one TM told us, "there was no real software competence in TMT." The chairman likewise stated, "[the CEO] said himself that he wasn't a software expert. That was true, [and] I wasn't a software expert either" (Ollila and Saukkomaa, 2013: 458). Another TM said, "The real lesson [from the Nokia case] is that you should not appoint someone who does not understand the technology . . . in a deep way, but only [knows it] through numbers, to be the CEO of a technology company." Ironically, several informants also questioned the technological competence of this TM, whose background was not in technology. A third TM also admitted, "When the business changes you have big masses of people, including people in top management, whose competence is not quite at the core here. Then, this kind of faith is formed that is partly based on the missing competence." Thus it seems that Nokia's TMs had low technological competence, which amplified the effects of the various fears on their decoupling interaction with MMs and contributed to the development of their over-optimistic capability perception.⁶ In addition, it is possible that TMs' low technological competence had a direct effect on Nokia's innovativeness. Had the TMs had higher technological competence, they would have made more informed and thus more optimal choices regarding technology.

⁶ As a counterfactual (a situation in which TMs have high technological competence), consider Steve Jobs' influence at Apple, which seemed to have a somewhat similar (if less extreme) fear profile as Nokia. Jobs felt high external fear regarding Apple's long-term success; he was very upset when Google announced Android and worried that it would destroy the iPhone (Isaacson, 2011: 511). He was also notorious for instilling fear among MMs (Apple Insider, 2013). But Jobs seemed reasonably in touch with the technology used in the iPhone and was closely involved in its development. For example, he spent "part of every day for six months helping to refine the [iPhone] display" (Isaacson, 2011: 469) and was extremely demanding about technological quality. Consequently, Jobs was likely able to make stretching yet realistic demands on product developers, and MMs, however scared they were of him, could not mislead him technologically. This pattern changed when Jobs stepped down: Jobs' successor, Tim Cook, had lower technological competence and might thus have been less able to critically assess his subordinates' communication. This might help explain why Apple launched its maps application in 2012 with so many errors that the company ultimately advised its customers to use Google's or Nokia's rival applications while Apple fixed its own (Apple, 2012).

Innovation Underperformance

Innovation underperformance at Nokia followed TMs' over-optimistic capability perception. As the TMs had an inaccurate understanding of their organization's capabilities, their decisions regarding resource allocation to various innovation processes were decoupled from organizational reality. Temporal myopia resulted, as illustrated by the additional data in table B5 of the Online Appendix. Nokia allocated disproportionate attention and resources to the development of new phone devices for short-term market demands at the expense of developing the OS software; TMs took little corrective action. One might infer that this "rigidity" occurred because threat perceptions caused TMs to think in narrow ways (cf. Staw, Sandelands, and Dutton, 1981), but this was not the case. Rather, rigidity in the form of temporal myopia came about because the information that the TMs received from MMs indicated that their current actions would lead to success. Nokia's TMs thus made boundedly rational decisions based on the inaccurate understanding that they had sufficient time, resources, and capabilities. Gradually, product quality declined.

Extant research suggests that modularity in software (e.g., MacCormack, Rusnak, and Baldwin, 2006) enables higher-quality development in the long term, although it does take time to develop such modularity. At Nokia, pressure to introduce new phone models in the short term deprived the Symbian unit of the time they needed to make the OS more modular:

[The Symbian OS software] had a very antiquated architecture in many ways, which [software developers] could never modernize and they weren't given the time to modernize. They tried to make very different kinds of products based on that architecture, which meant that they had to bolt on all sorts of things to make an individual product happen. And a terrible technical complexity emerged through that process. All sorts of product-specific things piled up in there that they could no longer maintain. . . . [For example,] the way the user interface was done, it was really old. A totally antique system. So doing anything with [this old system resulted in] very slow [performance]. Then instead of saying early on that we have to get rid of this [old system], it's not worth fixing it, they had just been patching it up. It might help in getting the next product out, but it doesn't solve the [core] problem. (UMM#7)

Another element of the problem was that Nokia's structural arrangements did not prevent product units' immediate needs from overwhelming the long-term needs of the Symbian software unit. In ambidextrous structures, the unit focusing on long-term development should not have short-term pressures (Christensen and Bower, 1996; Gilbert, 2005; Taylor and Helfat, 2009). But in Nokia's case, because of the emotional dynamics, TMs did not perceive a real and urgent need to change the structural relationship between the software unit and PUs. Instead:

Every PU sold the idea to top management that changes to the [OS] software were needed, or we won't be able to deliver in time. Or we won't be able to make a product that sells. And this led to a great decline in R&D productivity. The effort was fragmented into multiple programs and the OS software was not integrated. (UMM#6)

In Nokia's case, where the product was integrated hardware and software, and services are built on top of the hardware, integration must be done. The offering is integrated so the organization must also be integrated. We reflected on this a lot. The

good things that come from integration are that you get complementarities and the ability to keep things connected, but the negative side is that speed and flexibility suffer. . . . Structure must follow strategy. The strategy was to offer integrated solutions so the organization also needed to be integrated. It required a lot of coordination in the development. Retrospectively one can see that it was slow. In the end it was concluded that it was not possible [to develop software and hardware in the way Nokia was developing them]. (TM)

Nokia could have used several approaches to correct its temporal myopia, such as taking more time to improve Symbian or improving its capabilities to speed up long-term development. (Additional examples are described in Online Appendix table B5.) But TMs did not take any significant corrective action until they realized that Symbian had become unfixable.

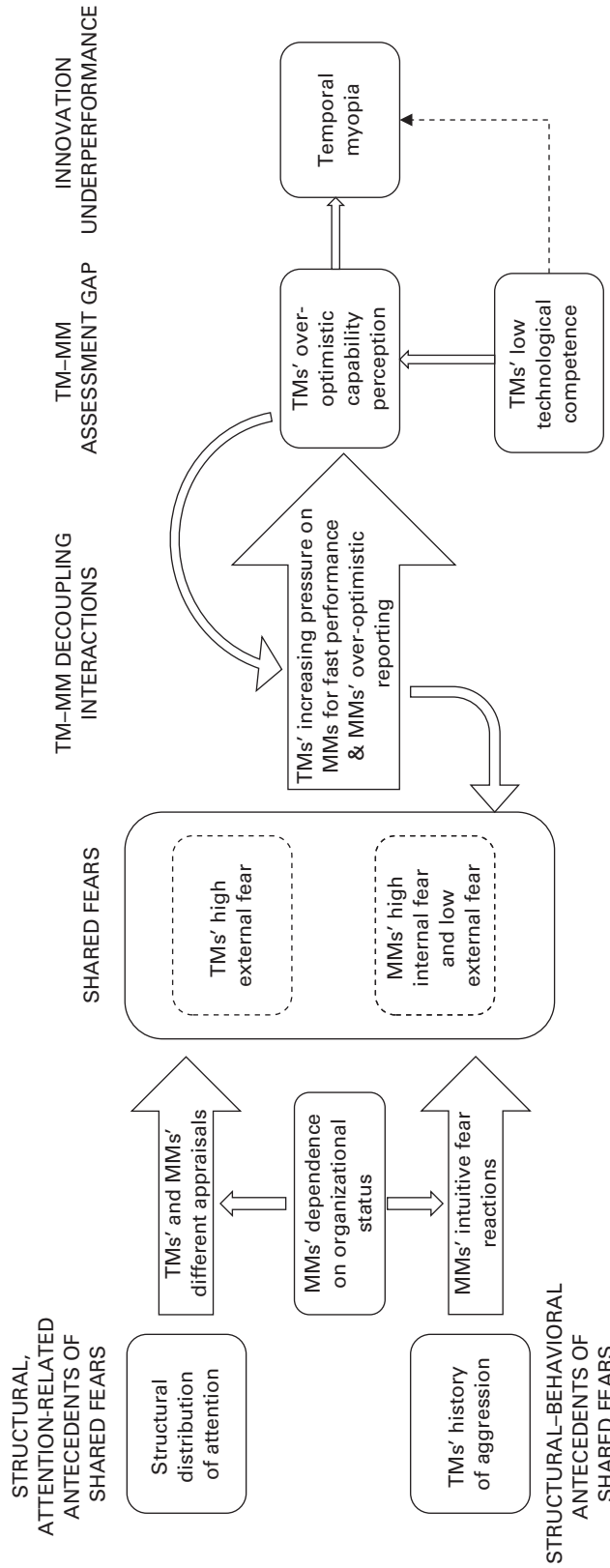
The quality of Nokia's high-end phones gradually declined—although the firm continued to produce dozens of successful medium- to low-end phones, which required less-advanced software. For example, in 2007, Nokia launched the N95 smartphone, which had full music features, GPS navigation, a large screen (not a touch screen), and full Internet browsing capability. Even though some “compromises [in software were] accepted to get the product ready on time” (Laukkanen, 2012: 71), it was still seen as a huge leap forward and went on to be the most profitable Nokia phone ever. But more serious quality problems soon emerged. In 2008, Nokia launched its first touch-screen phone, the 5800, at a lower price point than the iPhone. It was a commercial success, but “it was about one and a half years late” (TM) because of difficulties in software development. In 2009, Nokia launched the N97 to overthrow the iPhone and, according to an EVP, “change how people think about mobile devices” (Symbian-Freak, 2009), but the phone was a “total fiasco in terms of the quality of the product. Not just [in terms of] user experience, but anyone who used the product could see that it simply did not work” (TM). Another TM admitted that “N97 was a cold shower. It was so sudden and unexpected, that something was very wrong—that came as a surprise.”

In 2010, Nokia launched the N8, another purported “iPhone killer” with a touch screen. Its original intended launch date had been a year earlier. During the development process, the phone “was extensively tested [to ensure high quality], and it got delayed [repeatedly], and when it was tested again, the conclusion was that it still wasn't good enough. These delays proved fatal [i.e., prompted the company to search for a new CEO]” (TM). In addition, the N8 failed to match the competition: “Usability is where the Nokia N8 . . . falls short the most . . . if you are coming from webOS, iOS, or Android, things are likely to feel kludgy to you” (Mobile Burn, 2010). Nokia had been also developing its Linux-based OS, MeeGo, in parallel to Symbian, but it suffered from major development delays. A new CEO hired in September 2010 decided that Nokia would be better off buying software from external firms and thus struck a strategic alliance with Microsoft in February 2011. Microsoft ultimately acquired Nokia's phone businesses in 2013.

DISCUSSION

As summarized in figure 2, the structural distribution of attention at Nokia and TMs' past aggressive behaviors generated external and internal fear among TMs and MMs, respectively, and these different types of fear caused

Figure 2. Shared fears and innovation underperformance.



decoupling interactions between groups of TMs and MMs. These interactions produced an assessment gap of organizational capability between TMs and MMs that contributed to Nokia's innovation underperformance. In particular, internal and external fear led to TM–MM interaction cycles that led TMs to believe they could allocate resources to short-term developments without compromising long-term developments. The outcome was that long-term software development suffered, which hindered Nokia's ability to implement its strategy successfully. We also identified how MMs' dependence on organizational status amplified their internal fear; how a feedback loop from different groups' perceptions had the same effect; and how TMs' low technological competence increased their dependence on MMs' reporting, amplifying the effects of fear-based interactions.

On a broader theoretical level, the model presented in figure 2 suggests how organizational structures can influence micro-level factors such as emotions, TM–MM interaction, and cognition, which influence choices made during the innovation process and thus contribute to innovation outcomes at the organizational level. The model also includes the possible direct effect of top managers' low technological competence with a dashed line. By identifying these macro–micro–macro linkages in the model, we provide textured multilevel theorizing on innovation, strategy, and organization.

Structurally Based Fear

Our findings suggest that the structural distribution of attention in an organization (Ocasio, 1997) could lead TMs and MMs to experience external and internal fear, respectively, and that these emotions can have a substantial influence on behaviors and communication patterns in the innovation process. Our findings suggest that external fear might result when a group's organizational role is to focus mainly on threats in the external environment. Internal fear might result when a group's organizational role is to focus mainly on implementing and responding to other members' directives and requests. External and internal fears are primarily related to the focal group's roles in the organizational structure and could be more generally labeled as structurally based fear.

In contrast to prior research, which has investigated attention structures and their effects mainly from an unemotional, information-processing perspective (e.g., Ocasio, 2011; Gavetti et al., 2012), we have shown how attention structures could generate shared emotions among groups. Emotional reactions occur because when groups attend to information, it is not merely processed analytically to determine a satisfactory course of action but also triggers appraisals of the person–environment relationship that generate emotional reactions (Lazarus, 1991). During such appraisals, groups do not just process events through a retrospective lens but may also use the information to anticipate a future outcome (cf. Gavetti and Levinthal, 2000). Previous research has shown how such anticipation can happen through analogical reasoning (Gavetti, Levinthal, and Rivkin, 2005), discussions with venture capitalists (Maula, Keil, and Zahra, 2013), or collective sensemaking among members of the groups (Balogun and Johnson, 2004), but it has not investigated how the processes also trigger emotional reactions and how they influence subsequent behaviors.

Although prior research has focused on the evolution of cognition during innovation processes, our study reveals that the same processes can also elicit

emotional reactions that cause the processes' trajectory to diverge from the path predicted by purely cognitive accounts. A purely cognitive account might predict that distributed attention and frequent changes in MMs' positions would enable the organization to collect more comprehensive information (with each MM focusing on his or her specialized segment) and integrate such information through communication channels (cf. Joseph and Ocasio, 2012) to avoid various types of myopia (cf. Levinthal and March, 1993). Instead, our findings showed how the emotions that emerged as the outcomes of these practices hindered the integration of attention, leading to temporal myopia. This suggests that future research could shed new light on organizational structures by examining the shared emotions they create for different groups. Even if the organization in aggregate had accurate information about the environment, and TMs made choices accordingly, diverse groups' shared emotions could still influence the quality of information exchange.

Our study focused on what occurred in a traditional hierarchy, but we could think of other structural arrangements that might generate emotional reactions that harm organizational action and performance. For example, time-pacing and semi-structures (Brown and Eisenhardt, 1997) might, over time, inadvertently amplify MMs' internal fear and reduce their external fear, thereby causing innovation underperformance. Time-pacing "creates a relentless sense of urgency" (Brown and Eisenhardt, 1997: 24–25) that, if left unmanaged at the emotional level, might translate into internally focused fear and short-termism. Likewise, the inherent ambiguity of semi-structures may exacerbate MMs' focus on intra-organizational matters, as they strive to make sense of how and with whom they should exchange information. This excessive internal focus risks reducing the attention devoted to processing external threats, generating high internal fear and low external fear, which influence subsequent behavior.

Our data also suggest that employees such as MMs may seek to anticipate how future structural changes will affect their personal status and privileges, and this can trigger further emotional reactions that are not necessarily related to general business conditions. This suggests that some earlier ideas on the benefits of frequent structural change (e.g., Ethiraj and Levinthal, 2004; Teece, 2007) might need to be nuanced. For example, although simulation-based studies have suggested that frequent structural changes help avoid myopia in organizational attention (e.g., Siggelkow and Levinthal, 2005), our study reveals that these changes might also elicit high internal fear among MMs and cause harmful deceptive behavior.

Organizational structures could, moreover, influence MMs' fears through formal hierarchy. Existing research has shown that people are particularly sensitive to the behavior of individuals of higher power and status (Kish-Gephart et al., 2009). Some of Nokia's TMs expressed aggression toward MMs, and MMs shared stories about such instances widely. The emotional story sharing increased MMs' internal fear toward all TMs as a powerful group. This suggests that one reason less-hierarchical structures might foster innovation (Burns and Stalker, 1961) is that more organic, egalitarian structures dampen the effects of hierarchy-based fear and the potentially harmful effects of more-powerful groups. When the power difference between TMs and MMs is perceived as modest, TMs' aggression is less likely to amplify MMs' internal fear and thus less likely to cause extreme protective behavior.

MMs' dependence on organizational status could also affect how strongly the aforementioned structural factors influence MMs' internal fear. In Nokia's case, MMs' dependence on the status of their company was particularly high because Nokia was one of the few globally successful high-tech companies in small-population Finland. When MMs' status is highly dependent on their organization, they are likely to be more sensitive to threats inside the organization, because those threats exert a more immediate effect on MMs' perceived person-environment relationship; this increased sensitivity evokes emotional reactions (Lazarus, 1991). Central to such dependence is the relative weight given to organization-independent and organization-dependent factors in one's status: greater personal achievements should increase a person's independent status, whereas the high status of the organization should increase the effect of organizational membership on personal status. For example, a junior software engineer joining Google would enhance his or her personal status because of the company's high profile, whereas a Nobel Prize winner making the same move would receive less of a reputational boost, as he or she already had significant personal achievements. Hence, once hired, the engineer would probably experience higher internal fear than the Nobel Prize winner. This suggests the intriguing hypothesis that organizations might consider retaining their longer-tenured, successful MMs not just because of their rich tacit knowledge (e.g., Droege and Hoobler, 2003) but also because they are less likely to experience high internal fear and are therefore more likely to communicate honestly about organizational reality to people in higher formal positions—in particular, to be the bearers of bad news.

Though our data suggest how the structural distribution of attention and hierarchy can lead to different types of shared fear among diverse groups, organizational structures could also induce fear in other ways. For example, organizational structures that encourage groups to compete with one another likely generate different shared emotions than structures that promote collaboration (cf. Ouchi, 1977). Likewise, functional and divisional structures expose groups to diverse groups of actors and interests inside and outside the organization and could thus generate different emotional reactions. Future research could investigate more comprehensively how various structural factors influence diverse groups' emotions—both the discrete emotions that are experienced and the diverse targets of those emotions—and how these shared emotions subsequently influence organizational outcomes.

Integration of Attention

Diverse types of structurally based fear beg a deeper discussion of how such fears influence the organizational processes that are presumed to make any particular structural arrangement effective. The attention-based view of the firm emphasizes the centrality of integration of attention. This view assumes that different groups first distribute organizational attention (Ocasio, 1997) and then bring their perspectives together to facilitate high-quality decisions. Joseph and Ocasio (2012: 644) noted that this can happen through "open and frank dialogue" when appropriate channels are present (see also Henderson and Clark, 1990). But our study suggests that TMs' external and MMs' internal fear can foster interaction patterns that amplify rather than integrate differences in perspective, even with regular formal and informal meetings to integrate attention.

The communication channels within Nokia's formal structure were supposed to highlight key information; however, both MMs' and TMs' shared emotions reduced the accuracy of the information exchanged and biased subsequent strategic decision making. TMs' external fear led them to exert pressure on MMs without fully revealing the severity of the external threats and to interpret MMs' messages in biased ways. MMs' internal fear made them mislead TMs during their interactions.

The attention-based view of the firm has emphasized that organization members' attention is influenced by various contextual and situational factors (Ocasio, 1997, 2011). This reveals the sequential and cyclical nature of attention, in that what people attend to first likely shapes what they attend to later (cf. Weick, 1979). Our study reveals how various types of fear could shape this cyclical process in TM–MM interactions and extends our understanding of situational attention in organizations. Shared emotions felt in one group could influence the attention of another group: TMs' external fear can make them exert heavier pressure on MMs, which increases MMs' attention to intra-organizational threats; and MMs' high internal fear makes them communicate potential problems less openly to TMs, which reduces the attention TMs pay to those issues. Likewise, MMs' internal fear can reduce their disposition to publicly criticize their peers, which can reduce TMs' attention to potential weaknesses in open strategic debates. At Nokia, the outcome was that TMs' understanding of what the organization was capable of increasingly diverged from MMs' understanding, and this assessment gap contributed to Nokia's temporal myopia and innovation underperformance. Hence a deeper understanding of how the integration of distributed attention occurs in organizations would require scholars to consider the shared emotions that diverse groups experience as a result of their distributed attention and how those emotions influence their motivation and ability to share their views.

Our study tentatively suggests that MMs fearing external competition directly—as opposed to fearing TMs as a proxy of the external environment—might lead to more functional communication patterns (see also Grove, 1996). Though TMs might still exert excessive pressure on MMs, MMs' external fear could function as a corrective, allowing them to pay sufficient attention to threats in the external environment. With moderate internal fear and moderately high external fear, MMs might resist mounting pressure from TMs more assertively and be honest about what they could realistically deliver in a given timeframe, forcing TMs to revise their expectations and take timely adjusting actions. Future research could investigate this hypothesis, explore whether it is possible to elicit salutary, adaptive external fear among MMs, and investigate the associated side effects on other stakeholder groups such as shareholders and customers.

One could also speculate that TMs' high ability to regulate (e.g., Gross, 1998) their external fear might foster higher-quality interactions with MMs. In the Nokia case, TMs' high external fear caused them to put too much pressure on MMs and dismiss MMs' warnings. We wonder what might have happened if Nokia's TMs had tempered their high external fear somewhat, freeing their cognitive resources to consider the wider consequences of their actions. Such regulation of fear might have enabled them to stay attuned to the external threat while forming a better understanding of Nokia's internal context and to flexibly co-develop a more appropriate and timely corrective action plan with MMs.

Our research on the effect of structurally based fear also contributes to research on managerial cognition by identifying social–emotional processes that influence TMs' cognition. Even though the importance of managerial cognition has been well established (e.g., Tripsas and Gavetti, 2000), how intra-organizational processes shape TMs' cognition remains insufficiently understood (Gavetti et al., 2012; Eggers and Kaplan, 2013). Previous research has mainly focused on the impact of managerial cognition (e.g., Kaplan, 2008) or individual-level factors that might explain biases (e.g., Wagner and Gooding, 1997). Our inductive process model advances a social–emotional interaction view by describing how emotion-laden TM–MM interactions influenced the content of information conveyed to TMs and shaped their cognition. TMs were not just passive recipients of information; they actively shaped what would be communicated to them by influencing their subordinates' emotions both directly (through their directives) and indirectly (through structural choices). This suggests that one predictor of the accuracy of TMs' mental models could be their ability to influence the quality of their interaction with MMs by managing their own and MMs' emotions.

Limitations and Future Research

Because it is a one-company case study, our proposed process model comes with limitations that represent opportunities for future research. We focused on a fast-moving high-tech industry in which complex software development played a central role. TMs in other industries might find it easier to observe how well their companies are developing innovations. Hence, structurally based fear might have a weaker effect on innovation processes in industries in which core production elements are more easily observable and understandable. Moreover, the speed of feedback loops could be important: how quickly do the harmful consequences of miscommunication materialize? In business organizations, a lie might go undetected for months. But in settings such as flight decks (Weick and Roberts, 1993), navy ships (Hutchins, 1995), and emergency wards (Rico et al., 2008), miscommunication would lead to immediate negative consequences, triggering strong emotional reactions. Hence emotional reactions likely motivate honest reporting about problems in these contexts.

No theory in management research could be expected to explain all of the variance observed, and we do not claim that fear was the only factor contributing to Nokia's decline. We focused on explaining how fear emerged and influenced TMs' and MMs' interactions, contributing to temporal myopia that caused Nokia to lose the smartphone battle. We expect other scholars to suggest other plausible and complementary accounts of Nokia's decline. Beyond economic and structural factors that have occupied a central place in the strategic management of organizations, however, our study illuminates the importance of shared emotions among various groups and their powerful impact on firms' competitiveness.

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