Using the Collective Wisdom of Frontline Employees in Strategic Issue Management

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Carsten Lund Pedersen

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Acknowledgements

"Problems worthy of attack, prove their worth by hitting back". ~ Piet Hein (Danish poet – designer – scientist).

As I write this acknowledgments section at the very end of my PhD-journey, the above words seem to fully describe my past three years. This dissertation has both been some of the most fruitful and immensely challenging years of my life. Hopefully, the challenges encountered and endured during the process have resulted in interesting research for the readers, as I do see the research problem as being inherently *'worthy of attack'*. However, this journey could not have been completed if it had been traveled alone; hence, I need to thank my fellow travelers who followed along, as this dissertation is the product of the support, guidance and *collective wisdom* of many people who truly deserve a heartfelt thanks!

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Carsten Lund Pedersen,

Copenhagen, June 2016.

English abstract:

The field of strategic management has long alluded to the idea that lower-level employees immersed in the day-to-day business have experiential insights of potential strategic value. This line of thought has predominantly been supported by anecdotal evidence and explored in meticulous case studies to uncover the evolutionary traits of autonomous ventures. In a related vein, studies of 'strategic issue management' (SIM) tried to uncover organizational processes to identify emerging issues in volatile environments and devise proper strategic responses. These conceptual models were introduced in the very first volume of 'Strategic Management Journal', but little empirical research has since tried to develop the conception of SIM. An underlying research aim of this dissertation is to address and bridge these two literature streams, honing the idea of utilizing the collective wisdom possessed by frontline employees about ongoing changes in the internal and external environments as a unique information source to extend and advance SIM.

In view of this, the dissertation tries to answer the following research question: "*To what extent can frontline employees and customers predict firm performance – and how can it be utilized in SIM?"* In order to answer this question, the dissertation was divided into three different papers, each with a distinct research focus. The first paper is a conceptual study that reviews and builds theory, by arguing that the collective wisdom of frontline employees and customers can be utilized to predict firm performance and identify emerging issues in SIM. The second paper is a qualitative study that looks into how intended and emergent strategy processes interact over time in a particularly hostile industry context. The third paper is a quantitative study that seeks to measure the predictive accuracy, or collective wisdom, of frontline employees and customers in predicting firm performance. The study includes more than 150,000 individual forecasts based on 13,531 survey responses which is subsequently compared to measures of actual firm performance.

The findings of the three papers suggest that (i) frontline employees seem to be able to predict changes in revenue, incoming calls and customer satisfaction much more accurately than customers; (ii) these emergent insights are typically not utilized in strategy processes – which is predominantly a result of a hostile industry context, and (iii) certain employees may embark in maverick behaviors to be able to respond to emerging issues. In combination, the papers draw

the contours of an interactive approach to SIM, where the collective wisdom of frontline employees is actively utilized in the strategic analyses conducted by the corporate center.

The challenges associated with strategic management have steadily intensified in the wake of new technological developments resulting in increasingly complex and unpredictable conditions with an exponential growth in data availability. These emerging environmental settings provide new opportunities for firms to obtain insights from continuous streams of unstructured data, which accentuates the relevance of the topic of the present dissertation.

Dansk resumé (Danish abstract):

Strategi-feltet har længe kommet med antydninger til ideen om, at medarbejdere på lavere niveauer, der er beskæftiget i den daglige forretning, har erfaringsbaseret indsigt af potentiel strategisk værdi. Denne tankegang har hovedsageligt været understøttet af anekdotiske beviser og den er blevet undersøgt i omhyggelige case-studier for at afdække de evolutionære egenskaber ved autonome projekter. I et lignende rationale har studier inden for *'strategic issue management'* (SIM) søgt at afdække organisatoriske processer til at identificere *emergerende issues* i ustabile omgivelser samt at udarbejde passende strategiske svar dertil. Disse konceptuelle modeller blev introduceret i den allerførste udgivelse af *'Strategic Management Journal'*, men kun få empiriske studier har sidenhen søgt at udvikle SIM-konceptet. Et underliggende forskningsmål i nærværende afhandling er at adressere samt at bygge bro mellem disse to strømme i litteraturen ved at skærpe ideen omkring at bruge den kollektive visdom, som frontlinje-medarbejdere besidder omkring løbende forandringer i de interne og eksterne miljøer, som en unik informationskilde til at udvide samt videreudvikle SIM.

Set i lyset af dette, forsøger afhandlingen at besvare følgende forskningsspørgsmål: *"I hvilket omfang kan frontlinje-medarbejdere og kunder forudsige virksomheds-performance – og hvordan kan det blive brugt i SIM?"* For at kunne besvare dette spørgsmål, blev afhandlingen opdelt i tre forskellige artikler, hver med et klart forskningsfokus. Den første artikel er et konceptuelt studie, der gennemgår og bygger teori ved at argumentere for, at den kollektive visdom hos frontlinje-medarbejdere og kunder kan blive brugt til at forudsige virksomheds-performance samt at identificere emergerende issues i SIM. Den anden artikel er et kvalitativt studie, der kigger på, hvordan intenderede og emergente strategi-processer interagerer over tid i en særligt fjendtlig branche-kontekst. Den tredje artikel er et kvantitativt studie, der søger at måle den prædikative nøjagtighed, eller kollektive visdom, hos frontlinje-medarbejdere og kunder i forbindelse med forudsigelse af virksomheds-performance. Studiet inkluderer mere end 150.000 individuelle forudsigelser baseret på 13531 spørgeskema-besvarelser, der efterfølgende blev sammenholdt med mål for faktisk performance i virksomheden.

Resultaterne fra de tre artikler indikerer, at (i) frontlinje-medarbejdere lader til at være i stand til at kunne forudsige forandringer i omsætning, indkommende kald og kundetilfredshed meget mere præcist end kunder; (ii) disse emergerende indsigter bliver typisk ikke brugt i strategi-

processer – hvilket hovedsageligt er et resultat af en fjendtlig branche-kontekst, og (iii) visse medarbejdere kan begive sig ud i rebelsk adfærd for at være i stand til at kunne handle på emergerende issues. Artiklerne tegner i kombination konturerne af en interaktiv tilgang til SIM, hvor frontlinje-medarbejdernes kollektive visdom bliver brugt aktivt i de strategiske analyser, som virksomhedscenteret udfører.

De udfordringer, som er associeret med strategi-feltet, er støt intensiveret set i lyset af nye teknologiske udviklinger, der har resulteret i mere komplekse og uforudsigelige forhold med en eksponentiel vækst i tilgængeligheden af data. Disse emergerende kontekstuelle forhold giver nye muligheder for virksomheder til at få indsigt ud af kontinuerlige strømme af ustruktureret data, hvilket fremhæver relevansen af emnet i nærværende afhandling.

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Chapter 1

Introduction

1.1 The role of forecasting in strategy

Strategic management is often described as being preoccupied with attempting to anticipate future opportunities and threats, so the firm can take effective planned actions based on an intricate analysis and understanding of its internal strengths and weaknesses in the competitive landscape, in order to achieve its general objectives and strategic aims. Put differently, "when executives create strategy, they project themselves and their organizations into the future, creating a path from where they are now to where they want to be some years down the road" (Luehrman, 1998, p. 89). Hence, the notion of foresight has often been presumed to be an implicit element of the underlying process and rationale of the conventional approach to strategic management.

In other words, strategic reasoning entails processes where decision makers are first engaged in rational analyses of business conditions to identify a desirable strategic position in the environment and subsequently formulate a plan for achieving the predefined position (Andersen, 2013). As the described steps necessitate a *prediction* of the actions needed to achieve the desired position, as well as considerations about competitive trajectories, forecasting is logically an inherent element of the practices of strategic planning and strategic reasoning. Mintzberg (1994) referred to this inherent use of predictions in strategic planning as 'the fallacy of prediction' and noted that: "According to the premises of strategic planning, the world is supposed to hold still while a plan is being developed and then stay on the predicted course while that plan is being implemented" (p. 110).

As technology is rapidly altering the nature of competition (Bettis and Hitt, 1995), managers face major strategic discontinuities that complicate the substantial task of navigating their organizations safely in a sea of uncertainty. In a competitive reality where both internal and external environments are rapidly changing, judgmental forecasting and sensing of the first early signals of emerging developments become increasingly important (Ansoff, 1975, 1980). Studies have shown that few companies have sufficient capacity to sense, diagnose and act upon weak signals of impending opportunities and threats (Schoemaker and Day, 2009). For instance,

would the respective industries have evolved differently if competitors would have predicted Amazon's disruptive effect for brick-and-mortar bookstores, Apple's achievements within e.g., music and smartphones, or Uber's inroads into personal transportation? Moreover, would political decisions have been different if Western leaders could have predicted the rise of ISIS in Syria and Iraq, the annexation of Crimea by the Russian Federation in 2014, or would have foreseen Britain's recent vote to leave the EU, i.e., 'Brexit'? These contemporary examples illustrate that developments can emerge unexpectedly (that is, to most decision-makers at the upper echelons) and have a lasting effect on the future range of strategic options that are available.

Consequently, two aspects become apparent in this context: (i) Environmental turbulence and complexity make it essential to develop adaptive strategic response capabilities (Andersen and Bettis, 2015; Ansoff, 1975, 1980; Bettis and Hitt, 1995; Eisenhardt, 1989; Teece, 2007). If the environment evolves on an ongoing basis, strategy will – to a certain extent – similarly necessitate a certain amount of flexibility and responsiveness on an ongoing basis (Eisenhardt and Martin, 2000; Teece, Pisano and Shuen, 1997). (ii) Strategic response capabilities entail a certain amount of short-term predictive capabilities – here understood as the ability to forecast and sense early signals of emerging strategic issues (Ansoff, 1975, 1980). If a firm is to make a timely response in an environment that is driven by fast and hypercompetitive dynamics (Eisenhardt, 1989), it must be able to first sense and diagnose the early signals that comprise a warning of an impending threat or opportunity.

The model of strategic responsiveness, as described in Andersen (2013) and Andersen and Bettis (2015), presumes that firms compete to obtain a desirable fit between the requirements imposed by the environmental context and the position of the firm. As noted by Andersen (2013), "the fit-creating adaptations can be expressed as *strategic responsiveness*, where the firm is in possession of a bundle of capabilities to assess the environment, identify firm resources, and mobilize them in effective responsive actions" (p. 160). Consequently, a better match between environment and firm position increases firm performance in the form of both higher and more stable returns, as shown by Andersen and Bettis (2015). That is, simulations and empirical evidence based on the model of strategic responsiveness show that there is a longitudinal risk-return relationship, i.e., Bowman's paradox, particularly in so-called 'random

walk' environments (Andersen, 2013; Andersen and Bettis, 2015). Moreover, the notion of strategic responsiveness has commonalities with the concept of dynamic fit as it pursues the dynamic maintenance of market-firm congruence (Zajac, Kraatz and Bresser, 2000).

These studies provide a rationale for ongoing firm adaptation toward evolving environmental developments in order to maintain strategic fit. Here, it is anticipated that, "as the environment subsequently changes (e.g., competitors take unanticipated changes, new technologies arise), managers are able to sense significant change and reconfigure firm resources so as to maintain or reestablish fit" (Andersen and Bettis, 2015, p. 1135-1136). The strategic responsiveness model provides a strategic rationale for obtaining above average profitability in volatile environments (Bettis and Hitt, 1995), which opens up for the strategic utility of forecasts and ongoing sensing of early signals of impending events, as depicted in the early frameworks of strategic issue management (Ansoff, 1975, 1980). Moreover, conceptualizing strategy as a series of real options has similarly incorporated the needed flexibility and uncertainty considerations into strategic management in volatile environments (Luehrman, 1998), which is another approach for strategizing in a context of unknowability.

Given that history is filled with examples of disastrously bad forecasts, it is clear that firms need an approach towards incorporating effective forecasts into planning – and for dealing with uncertainty (Makridakis, Hogarth, and Gaba, 2010). Knight (1921) distinguished between risk and uncertainty, where the probability of the former can be measured whereas the probability of the latter cannot. According to Makridakis, Hogarth and Gaba (2010), accurate predictions are not possible in many areas of business, as future uncertainty is much greater than managers often presume or acknowledge. That is, businesses often try to measure the probability of situations characterized by uncertainty. This may result in disastrous outcomes which emphasize the importance of forecasting methods that can distinguish between, and appropriately synthesize, issues of both risk and uncertainty. Uncertainty is furthermore an intricate part of strategy, as noted by Wernerfelt and Karnani (1987): "Since strategy is concerned with the future, the strategic context of a firm is always uncertain, although the degree and the sources of uncertainty may be different for different firms" (p. 187). In a similar vein, Eisenhardt and Sull (2001, p. 116) argue that: "In stable markets, managers can rely on complicated strategies built on detailed predictions of the future. But in complicated, fast-

moving markets where significant growth and wealth creation can occur, unpredictability reigns".

As competitive dynamics are becoming increasingly volatile and uncertain, research in the areas of prediction and forecasting seem to have fallen out of flavor within strategic management (Duus, 1999). Duus (1999) attributes this development to the underlying shift in strategy from Porterian five forces, born out of the marriage between Harvard and the prevalent business thinking at the time, to today's focus on resources, competencies, networks and relations.

Contrary to strategy's diminishing focus on forecasting, Duus (1999) sees strategic forecasting (i.e., the combination of forecasting and strategic planning) to be in line with the resource-based view of the firm, as he states that, "… the development of systems and methodologies for predicting future events has received strong support from the resource or competence based theory of strategy" (Duus, 1999, p. 178), and he goes on to cite Barney (1991) arguing that an information processing system embedded in management decision-making processes may hold the potential for sustained competitive advantage.

Consequently, the following points can be established from the preceding. Firstly, the environmental context has become increasingly volatile which stresses the importance of strategic responsiveness. Strategic responsiveness entails a competence in forecasting and sensing in order to facilitate firm adaptation. Secondly, forecasting often has a bad 'track record', as managers tend to underestimate the role of future uncertainty in their areas of business. This shortcoming suggests that there is a need for methods and systems to effectively incorporate both risk and uncertainty in forecasts. Thirdly, forecasting seems to have fallen out of fashion in the literature in strategic management, although it is an inherent element of strategy. In contrast, it is found to not only be relevant for contemporary competitive challenges, but also consistent with seminal traditions.

In order to further develop this latter point, the following will briefly explicate the inherent nature of the strategy concept from various dominant views. That is, the following will review the classical debate between the design/planning school on strategy versus the learning school of strategy.

1.2 The nature of strategy: Linking thinking and doing

The core nature of strategy benefits from explicit discussion before theoretically developing or empirically observing the phenomenon. Hence, a short review and discussion of the nature of strategy, and the rationales for the present project's presumptions of the concept, will be provided in the following sections. Starting from the seminal 'wedge' between the planning/design and learning schools of strategy (Ansoff, 1991; Mintzberg, 1990, 1991), which have seemingly differing opinions of the precedence of thought over action, this author will argue for an integrative and interactive perspective on strategy (Andersen, 2004; Brews and Hunt, 1999; Burgelman and Grove, 1996; Grant, 2003).

At its root, strategy has been conceptualized as both designed plans linking objectives and actions – and as emergent developments creating unforeseen patterns in the firm's behavior. Where the former has often been described as top-down driven processes, the latter has predominantly been described as bottom-up emerging developments. This distinction between the planning/design and learning schools led to a seminal, yet bitter, debate between two prominent strategy scholars, Igor Ansoff and Henry Mintzberg, where Ansoff (1991) argued for the benefits of formal planning in both stable and unstable environmental contexts, while Mintzberg (1990, 1991) posited that learning and logical incrementalism comprise a better description of strategy (as echoed by e.g., Quinn (1980)).

In order to fully illustrate the distinction between the two positions, and provide a sound rationale for the present project's comprehension of 'strategy', the logics of the two different approaches must be explicated. The 'prescriptive schools' in strategy[1] have traditionally emphasized the importance of rigorous analyses and careful assessment of alternatives, often conveying a necessity of rationality, formal processes and deliberate planning in order to obtain a strategic fit between firm competences and the environment. As noted by Ansoff (1991), "…explicit strategy formulation is typically used in environments in which managers are not 'sure' about the future […] they formulate strategy precisely because being 'unsure' makes it dangerous to assume that the firm's future will be an extrapolation of the past" (p.456). Hence, Ansoff (1991) argues that planning is particularly important and prevalent under environmental

[1] According to Mintzberg (1990, 1991, 1994), these schools consist of the design school, the planning school and the positioning school.

uncertainty – which goes against Mintzberg's (1990) argument that explicit strategies may become blinders designed to focus direction and block out peripheral vision (p.184). Moreover, Ansoff (1975, 1980, 1991) developed the notion of *real time response*, and proposed strategic issue management as practical real time response procedure(s), meant as an alternative to periodic strategy planning that could deal with emerging issues in volatile environments. Mintzberg's (1990, 1991) main critique with the design school (alongside the other prescriptive schools) revolved around their promotion of thought independent of action, i.e., strategy formation as a process of conception rather than learning. Put differently, Mintzberg's (1987, 1990, 1991, 1994) writing reflects a contrarian argument that strategy has traditionally separated *thinking* from *doing*, precluding learning once the strategy has been formulated. In contrast to the traditional view of strategy as being concerned with rational planning and forward-looking thinking, Mintzberg (1987) draws the contours of a different understanding of strategy. In Mintzberg's (1987) view, strategy has more in common with the potter who molds the clay based on her intuitive sensing – in combination with an acute awareness of both past experiences and future prospects. Put differently, Mintzberg (1987) states that "the crafting image better captures the process by which effective strategies come to be. The planning image, long popular in the literature, distorts these processes and thereby misguides organizations that embrace it unreservedly" (p. 66). Consequently, Mintzberg (1987, 1990, 1991, 1994) sees the strategist as a 'craftsman', and emphasizes the experiential knowledge that may be fostered by ongoing learning from incremental actions, and which may, in retrospect, show itself as a pattern in behavior.

Although there has traditionally been a seminal distinction between planning and learning within the strategy literature, as well as disagreements on the role of environment in this dichotomy, various empirical studies have been able to shed light on the topic in practice. For instance, Brews and Hunt (1999) have sought to reconcile this long-standing debate, and argue that formal planning and incrementalism both form part of 'good strategic planning', as firms both need to learn to plan and plan to learn. In their study, they find that environment "neither moderates the need for formal planning nor the direction of the planning/performance relationship" (Brews and Hunt, 1999, p. 889). In a related vein, Grant (2003) provides evidence that point to a possible reconciliation of the two positions on strategy formulation, as his study suggested that volatile business environments promote planning systems that foster adaptation

and responsiveness, i.e., planned emergence. Moreover, Andersen (2004) has argued that the two strategy modes can interact, as central strategic reasoning can be updated by local adaptive responses taken by functional managers and employees at the periphery of the organization to enable an ongoing interaction fueling tactical considerations. Consequently, there are empirical and theoretical arguments for integrating the two strategy modes into an interactive model.

A careful reading of both Ansoff (1975, 1980, 1991) and Mintzberg (1987, 1990, 1991, 1994) suggests that they actually do have some commonalities that make it possible to synthesize the two positions. Firstly, although Ansoff (1975, 1980, 1991) emphasizes planning, he has similarly highlighted the need for processes/systems to deal with emerging issues in between periodic planning, i.e., strategic issue management systems. Stated differently, Ansoff (1975) introduced strategic issue management to overcome the "… inability of strategic planning to handle quickly and efficiently individual fast-developing threats and opportunities" which entails "the rigidity of the planning calendar, including six to nine-month delays between initiation and completion of the planning cycle" (p. 32). However, Ansoff (1975) is similarly quick to emphasize that "… it is dangerous to use strategic issue management without adjoining strategic planning to it" (p.32). Camillus and Datta (1991) have echoed this notion by arguing that strategic planning and SIM can be integrated in a manner that complement their respective strengths and mitigate their individual weaknesses.

In a similar vein, much of Mintzberg's work (e.g., 1987, 1990, 1991, 1994) more or less alludes to the combination of both deliberate and emergent strategy – where realized strategy can be both formulated and formed. Hence, strategy-making seems to walk on two feet, where one is deliberate and the other is emergent (Mintzberg and Waters, 1985), suggesting a certain level of interaction is needed between the two to move the organization effectively forward.

Table 1.1: Different positions and perspectives in strategy.

Perspective --- **Analytical dimensions**	**Planning/design – 'deliberate'**	**Learning/doing – 'emergent'**	**Integrative/interactive – 'walking on two feet'**
Philosophy:	• Teleological • Causal • A priori • Rationalism	• Non-teleological • Effectuation • A posteriori • Process philosophy	• Teleological • Non-teleological • Reality of paradoxes • Process philosophy
Metaphors:	• Mind • The army general • Thinking strategy	• Hands • The frontline/trenches • Crafting strategy	• Mind *and* hands • Walking on two feet • Strategy dynamics
Key elements:	• Analyses • Rationality • Plans	• Learning-by-doing • Experiences • Actions	• Managing paradoxes • Interactive updating • Combining
Key action:	• Thinking first	• Doing first	• Interacting first
Commonalities:	• Planning dominates the strategy literature, but execution is also essential		
Characteristics:	• Formal • Linear	• Informal • Iterative/non-linear	• Formal/linear *and* • Informal/iterative
Perspective:	• Top-down	• Mainly bottom-up • Sometimes top-driven	• Top-down *and* • Bottom-up
Notable contributions:	• Andrews (1965) • Ansoff (1965)	• Mintzberg (1987, 1990, 1991, 1994) • Quinn (1980)	• Andersen (2004, 2015) • Brews and Hunt (1999) • Burgelman and Grove (1996). • Camillus and Datta (1991). • Grant (2003)

Source: Author's own creation

The present dissertation adopts a view on strategy that subscribes to the integrative/interactive perspective (table 1.1). The integrative/interactive perspective denotes "… the interaction dynamic between the central planning activities and decentralized response initiatives taken by many individuals throughout the organization" where strategy more specifically is viewed as "…a process where organizational activities eventually shape and form the realized strategies as time goes by" (Andersen, 2013, p. 146). Hence, the perspective has explicit focus on strategy as streams of diverse decisions, actions and processes that evolve over time and take place at different levels of an organization.

The reasons for adopting this perspective are three-fold. Firstly, both deliberate and emergent processes are acknowledged to exist in real-world organizations, which similarly

means that an ambition to (better) understand strategy formation in practice necessitates that the interaction between these two strategy modes is investigated. Secondly, the different positions reflect how strategy-making are typically perceived at various locations and levels in organizations. Consequently, an intention to understand strategy formation at different locations and levels in an organization needs to incorporate the two perceptions of strategy into an interactive approach. Thirdly, the present project follows and extends empirical and theoretical studies that argue that it is the *interaction* between central deliberate strategic reasoning and peripheral emergent responses that may provide the most fruitful strategic trajectory as described in e.g., Andersen (2004, 2015), Brews and Hunt (1999), and Grant (2003).

1.3 The literature on strategic issues

Having explicated how integrative/interactive strategy pursues a joint emphasis on planning and learning-by-doing, the review will subsequently turn to the literature under the umbrella-term 'strategic issues', i.e., the literary streams of strategic issue management, strategic issue diagnosis and strategic issue selling (see table below).

According to Ansoff (1980), the founding father of strategic issue management systems, an issue "… may be a welcome issue, an *opportunity* to be grasped in the environment, or an internal *strength* which can be exploited to advantage. Or it can be an unwelcome external *threat*, or an internal *weakness*, which imperils continuing success, even the survival of the enterprise" (Ansoff, 1980, p. 133). The ambition of Ansoff (1975, 1980) was to create a formal and rational process that took emergence into account. As Ansoff (1975) noted, "if, as experience suggests, modern planning technology does not ensure against surprises, the technology needs to be extended to provide such insurance" (p. 21).

Hence, the literature on SIM seems to be able to synthesize rationales of both emergence and formal planning, which reconciles the two seminal standpoints in strategy. Table 1.2 provides an overview of the different literary streams concerning strategic issues.

Table 1.2: Different literary streams on strategic issues.

	LITERARY STREAMS ON STRATEGIC ISSUES		
Literary streams **----------** **Analytical dimensions**	**Strategic issue management**	**Strategic issue diagnosis**	**Strategic issue selling**
Definition:	• "… a systematic procedure for *early* identification and *fast* response to important trends and events both inside and outside an enterprise" (Ansoff, 1980, p. 134).	• "the individual-level, cognitive process through which decision-makers form interpretations about organizational events, developments and trends" (Dutton, 1993, p. 339).	• "Issue selling refers to individuals' behaviors that are directed toward affecting others' attention to and understanding of issues" (Dutton and Ashford, 1993, p. 398).
Key focus:	• System	• Interpretative	
Analytical aim:	• Prescriptive	• Descriptive/explanatory	
Commonalities:	• Strategic issues are essential in business. • Strategic issues are predominantly a managerial domain. • They all generally follow Ansoff's (1980) definition on strategic issues stating that strategic issues are events, developments, or trends that are viewed as having implications for organizational performance (however, they differ on the extent to which they perceive issues as being inherently strategic).		
Notable contributions:	• Ansoff (1975, 1980). • Ansoff and Sullivan (1993). • Camillus and Datta (1991). • Dutton and Ottensmeyer (1987).	• Dutton, Fahey and Narayanan (1983). • Dutton and Duncan, (1987). • Dutton and Jackson (1987). • Dutton (1993).	• Dutton and Ashford (1993). • Dutton, Ashford, Wierba, O'Neill and Hayes (1997). • Dutton, Ashford, O'Neill and Lawrence (2001).

Source: Author's own creation

Ansoff's (1980) work focusing on strategic issue management systems (SIMS) forms the foundational basis of the various literary streams on strategic issues. Ansoff's (1975, 1980) work was prescriptive and practical in nature, and it predominantly focused upon the system and formal processes of preventing emerging threats and exploiting emerging opportunities. Essential to the notion of SIM is the detection and responses to *early* and often *weak* signals. As noted by Ansoff (1975), "when a threat/opportunity first appears on the horizon, we must be prepared for very vague information, which will progressively develop and improve with time" (p. 24). Hence, forecasting and flexible decision structures become increasingly important in

maintaining an effective response capability. Moreover, reconciliation of thinking and doing is apparent in SIM, as "strategic issue management is an action, and not a purely planning, system […] Planning and implementation are not separated" (Ansoff, 1975, p. 31), which illustrates one way to pursue the integrative/interactive approach to strategy.

Dutton et al.'s (1983) subsequent work on strategic issue diagnosis (SID) marked an interpretive turn, as the literary stream started to emphasize the individual-level cognitive processes through which decision-makers form interpretations about issues. Contrary to Ansoff's (1975, 1980) initial conception, Dutton and Ashford (1993) argue that, "No issue is inherently strategic. Rather, an issue becomes strategic when top management believes that it has relevance for organizational performance" (p. 397). Whereas Ansoff (1975, 1980) acknowledged the importance of managerial interpretations of emerging issues, he still alluded to the argument that issues could affect organizational performance regardless of the attention of decision-makers. Consequently, the interpretive dimensions of strategic issues in making adaptive decisions took precedence over formal systems/processes with the advent of the literary stream in SID.

The concept of strategic issue selling was conceived following the scholarly interest in strategic issue diagnosis (SID). The literary stream on strategic issue selling was a natural extension of the interpretive turn on strategic issues, as it focuses on individuals' actions directed toward affecting decision-makers' attention to and understanding of issues. Consequently, the interpersonal dynamics' influence on SID could be theorized and observed in real-world settings with the advent of the literature on strategic issue selling.

Where the literature on SIM focuses on the system, the literature on SID and strategic issue selling focuses on the interpretive, cognitive and interpersonal dimensions entailed in the decision making processes of organizations. Hence, the literatures are complementary, albeit the nature of the literature on strategic issues evolved into distinct streams with different areas of interest. Moreover, it should be emphasized that all of the literary streams perceive strategic issues to be the domain of managers. Although strategic issue selling (indirectly) opens up for the possibility that lower-level employees may first sense, and subsequently seek to affect and influence top managers' attention to and understanding of, the issues – this stream of studies have traditionally focused on middle managers and not on frontline employees in particular.

Consequently, the role of frontline employees has remained elusive in the literature on strategic issues, although few notable exceptions have alluded to their potential in identifying issues (e.g., Hallin, Andersen and Tveterås, 2012; Potter and Lipinski, 2009).

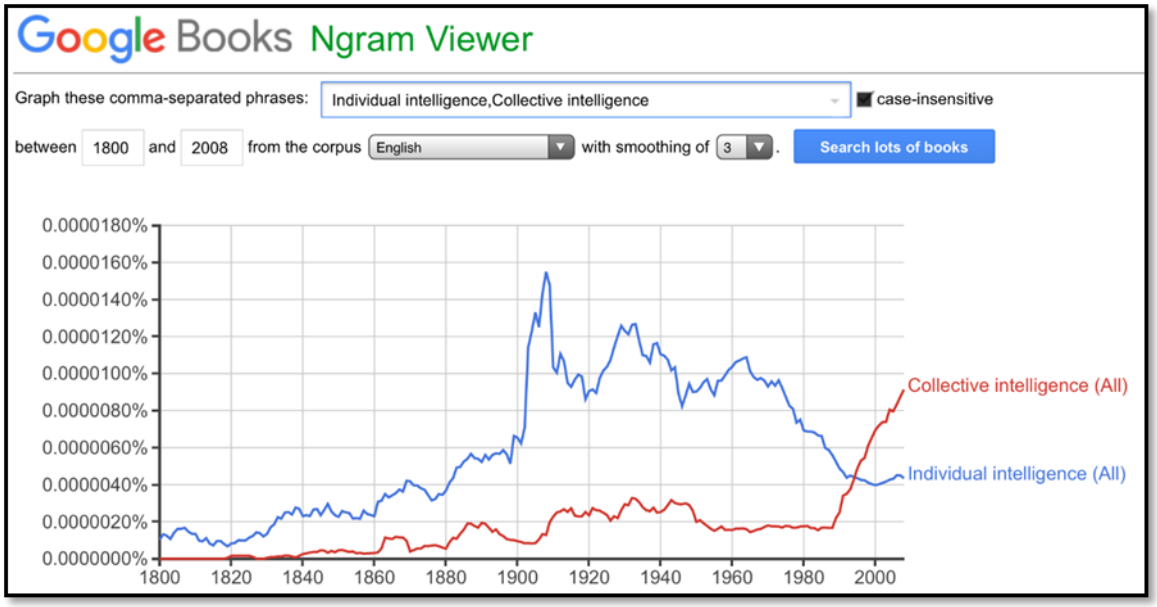
1.4 Collective wisdom

The notion of collective wisdom is a concept that has been known for centuries, but has recently witnessed a surge in popularity partly due to Surowiecki's (2004) book on 'The wisdom of crowds' combined with technological developments that make it possible to tie together dispersed knowledge within social networks. According to Surowiecki (2004), the wisdom of crowds can be described as follows: "under the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in them […] Even if most of the people within a group are not especially well-informed or rational, it can still reach a collectively wise decision" (p. XIII – XIV).

Collectively wise behavior is similarly seen in animal swarms which have certain similarities to the phenomenon (Fisher, 2009). Landemore (2012) sees the notion of 'collective wisdom' as both old and new: It is old as its origins can be traced back to Aristotle – but it is similarly new, as it has resurfaced in the past ten years in a substantially different guise that differs from Aristotle's original notions of the concept. Moreover, collective wisdom has certain conceptual commonalities with the notion of 'distributed cognition' (Hutchins, 1995), which emphasizes that cognitive phenomena are often distributed across individuals and artifacts transcending the boundaries of the single individual.

Although it has been documented that the concept of 'collective intelligence' has been alluded to since at least the 1800's (and as previously described, some sources trace the concept back even further to the work of Aristotle or as being an inherent dimension in human evolution), recent years have witnessed a surging interest in collective intelligence research and practice, partly enabled by IT developments that drive and impact daily activities in the lives of people across the globe (Malone and Bernstein, 2015). This development is evident in figure 1.1 from Google Books Ngram viewer.

Figure 1.1: The evolution of 'collective intelligence' on Google Ngram viewer.



Source: Google Ngram viewer

Google Ngrams has indexed millions of books published tracking the popularity of words over time (Gloor, forthcoming); hence, the tool makes it possible to conduct a quantitative analysis of cultural trends mining word usage in millions of digitized books (Michel et al., 2010). Looking at the word usage of "collective intelligence", and adding "individual intelligence" as a comparative benchmark, shows that collective intelligence is an old term that experienced steady growth since the late 1980s. In contrast, the term 'individual intelligence' has experienced declining attention, and was even surpassed by collective intelligence in the 1990's. Although these trends should not be seen as definitive evidence without any methodological flaws, combining the described statistical trends from google ngrams with the literature review suggests a rising interest in collective intelligence.

Here, it is relevant to reflect on the many different concepts and definitions that seem to revolve around a somewhat identical phenomenon. The phenomenon has been referred to as e.g., the wisdom of crowds (Surowiecki, 2004), collective intelligence (Malone, Laubacher, and Dellarocas, 2010), swarm creativity (Gloor, 2006), swarm intelligence (Fisher, 2009), and collective wisdom (Landemore and Elster, 2012). Moreover, eclectic contributions have been made in diverse fields such as computer science, social computing, artificial intelligence,

economics, biology, organization studies, cognitive sciences, and social psychology to name a few. The present dissertation utilizes the phrase 'collective wisdom' as (i) it combines dimensions of the concepts of 'collective intelligence' and 'the wisdom of crowds', and (ii) the word 'wisdom' has been chosen over 'intelligence' as it is a more encompassing notion that similarly distinguishes itself of the computer science connotations often entailed in the phrase 'collective intelligence' (Landemore and Elster, 2012). In this dissertation 'collective wisdom' is seen as an outcome, and due to the predictive focus, it pursues a definition often found in predictive studies: "Collective wisdom, as we shall define it here, exists when the crowd outperforms the individuals that comprise it at a predictive task" (Hong and Page, 2011, p. 2).

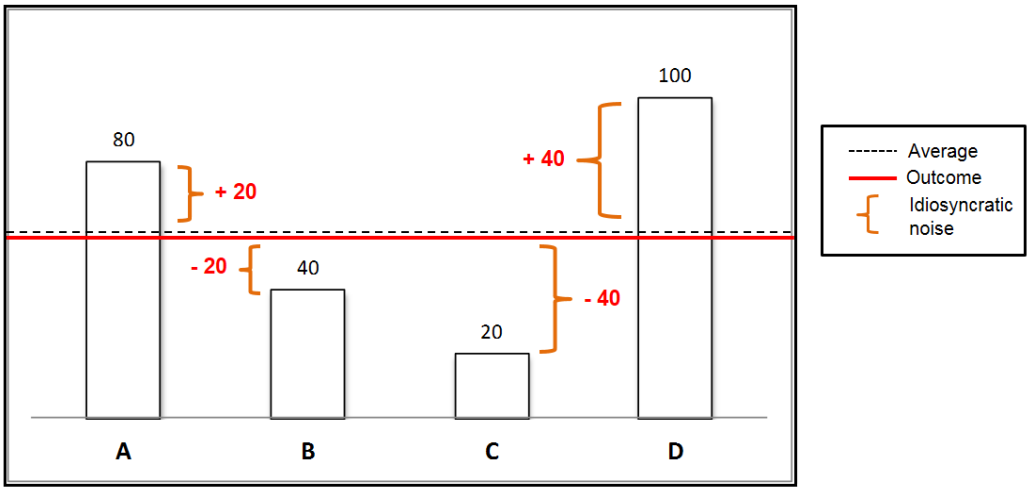
The recent work on predictive accuracy of groups of individuals can roughly be subdivided into two popular streams. One literary stream on collective wisdom seeks to understand the pre-requisites and boundary conditions for obtaining collective wisdom when predicting events (Page, 2007; Surowiecki, 2004). Another literary stream focuses on the individual traits of the most consistently accurate forecasters (Mannes, Soll and Larrick, 2014; Tetlock, 2005; Tetlock and Gardner, 2015). The present dissertation is arguably positioned between these two stands, as (i) it acknowledges that generic pre-requisites such as ability, diversity and independence are needed to obtain collective wisdom, and that (ii) individual boundary-spanning employees operating on a daily basis in an exposed position may be pre-disposed to be consistently good collective forecasters. Hence, the environmental context of the specific organization may condition individuals to be good (collective) forecasters. However, the underlying dynamics of collective wisdom must be further explicated.

Figure 1.2 illustrates the underlying dynamics of collective wisdom, where individual forecasts are provided independently, and the idiosyncratic forecasting errors cancel each other out, so the signal remains in the group average. The figure provides a thought-up illustrative example that can explicate some of the mathematical principles that comprise popular notions of the wisdom of crowds and collective intelligence (Page, 2007; Surowiecki, 2004). The figure illustrates four forecasts of the number of units sold in a store on a given day. Each forecast is provided by an individual salesperson in the store. Salesperson A predicts 80 – salesperson B predicts 40 – salesperson C predicts 20 – and salesperson D predicts 100. The high variance among the forecasters suggest that (i) the forecasts are provided independently of one another,

and (ii) there is a high degree of cognitive diversity among the forecasters, i.e., they utilize slightly different interpretations and predictive models. Moreover, this means that their prediction errors are not positively correlated, i.e., they do not make the same mistakes which is an essential element of collective wisdom. Consequently, the individual forecasting errors can be perceived as idiosyncratic noise, and because this idiosyncratic noise is not perfectly positively correlated with each other, the noise will predominantly cancel itself out while retaining the underlying signal when it is combined. The consequence of this aggregation of dispersed forecasts is that the average of the four forecasts (60 units) is identical to the actual number of units sold in the store on a given day (60 units). Therefore, the example illustrates the paradoxical situation where the collective average perfectly fits the actual outcome, although the individual forecasts that comprise the group are each far from the actual outcome.

One way of making sense of this paradox is by remembering that the individual forecasters must provide *knowledgable* forecasts, i.e., their forecasts must be based upon reasonable assumptions rather than random guesses. Hence, each individual forecaster may know *a piece of relevant knowledge* for the forecast, but they do not have perfect knowledge to provide the *full picture of the future.* Only by aggregating these dispersed pieces of insight can one obtain a more comprehensive picture, similar to a jiggzaw puzzle.

Figure 1.2: How collective wisdom works.



Source: Author's own creation

In making a logical case for diversity, Page (2007) has formulated the so-called diversity prediction theorem that explicates how both ability and diversity matter in predictive tasks, but especially focusing on how diversity in predictive models reduces collective error. Inspired by the diversity prediction theorem and examples by Page (2007), the following section will seek to run the above thought-up example through Page's rationale, in particular the diversity prediction theorem. The vantage point of Page's (2007) model is that the squared error of (i) the various forecasters, and (ii) the group average is calculated. The formula for this, in Page's (2007) elaboration of the notion, is as follows.

$$Squared\ error = (Actual\ outcome - predicted\ outcome)^2 \quad (1)$$

If formula 1 is applied on the thought-experiment of salespeople as forecasters of units sold on a given day, the following squared errors will be apparent as illustrated in table 1.3.

Table 1.3: An illustrated example of squared errors.

	Person A	***Person B***	***Person C***	***Person D***	***Crowd***
Squared Error	400	400	1600	1600	0

Source: Author's own creation inspired by Page (2007)

Here persons A and B each have a squared error of 400, while persons C and B each have a squared error of 1600. The group average was completely accurate leading to a squared error of 0. This leads to the formulation of the prediction diversity theorem by Page (2007) which says that:

$$Crowd\ error = Average\ individual\ error - Prediction\ diversity \quad (2)$$

Where 'average individual error' is simply the average squared error of the four forecasters, which in this case is 1000 and thereby constitutes a measure of forecasting 'ability', prediction diversity is diversity in predictive models and is simply calculated as follows:

$$Prediction\ diversity = Variance\ of\ individual\ predictions \quad (3)$$

As the variance refers to the variance of the individual predictions, which in this case are 80, 40, 20, 100, it leads to a variance of 1000. When plotting the various numbers into the diversity prediction theorem in formula 2, the following appears as illustrated in table 1.4:

Table 1.4: Illustrated diversity prediction theorem.

Illustrated diversity prediction theorem
Crowd error = Average individual error – Prediction diversity
0 = 1000 – 1000

Source: Author's own creation inspired by Page (2007)

Here, the collective squared error was 0, as the average individual squared error (1000) was offset by the prediction diversity in the group squared error (1000). The specific numerical values were meant to illustrate the theorem, but the quantitative relationships implied by the theorem will always apply according to Page (2007). The theorem states that (i) the crowd will never do worse than its average member, and (ii) that ability (average individual error) and prediction diversity (variance in predictions) carry equal weight in determining collective error. Hence, "it says that prediction diversity matters just as much as individual prediction accuracy when putting together a crowd of predictors […] That is not a feel-good statement. It's a mathematical fact" (Page, 2007, p. 13). However, the theorem does not state that the group will always do better than all of its members – only its average member. Consequently, situations may arise where a subset of the crowd may consistently outperform the group average. However, in an evolving and complex environment relevant pieces of information are often dispersed across the organization, suggesting that it would be unlikely that a few individuals could consistently out-predict a knowledgeable crowd on different predictive tasks over time. Having reviewed the concept of collective wisdom, the following will briefly tie the concept

together with the previously discussed literary developments in strategy to argue for the usage of the collective wisdom of the frontline in strategic issue management (SIM).

1.5 Using the collective wisdom of the frontline in SIM

A key question in strategic management is where to obtain accurate insights to inform timely firm responses, as competitive advantage in dynamic environments relies on the ability to observe environmental changes as they evolve to create early strategic responses (Ansoff, 1975, 1980; Dutton and Duncan, 1987; Eisenhardt, 1989; Potter and Lipinsky, 2009). Eisenhardt and Martin (2000) suggest that dynamic adaptive capabilities in high velocity environments depend on updated real time information from interacting individuals. As noted by Mintzberg (1987, p.69), it may be the salesperson out in the field who has the most strategic bit of information in the entire organization, but this information is useless if it is not conveyed to relevant decision-makers in the firm. This points towards an unfortunate shortcoming in the literature on strategic issues: The literary streams on strategic issue management (SIM) and strategic issue diagnosis (SID) have traditionally overlooked the strategic potential of frontline employees' collective wisdom. The firm's frontline employees, who are most closely associated with the firm's operational activities, accumulate intricate knowledge about day-to-day operational factors that influence organizational performance.

Yet, analyses of communication flows within an organization have shown that relevant decision makers rarely engage with customer service employees - which may result in problematic outcomes, as diverse input tend to improve decisions (Pentland, 2014). Moreover, Eisenhardt and Martin (2000) argue that in high velocity environments firm adaptation depends on real-time information from interacting individuals, as "real-time information alerts people early on to the need to adjust their actions since problems and opportunities are spotted more quickly than when individuals were more distant from information" (p. 1112). Often times, negative customer feedback will remain as private information among people down in the organizational hierarchy, and in turn, not be captured by formal management reports (Stieger, Matzler, Chatterjee & Ladstaetter-Fusseneger, 2012). Put differently, "…although it is usually lower-level employees who interact directly with the customer, decision makers rarely ask them how, for example, new products will fare. Leaders therefore deprive themselves of information that could enrich their analysis and reduce the risk of ivory tower decision making" (Dye, 2008,

p. 83). Paradoxically, this means that companies often do not know what they know (Potter and Lipinsky, 2009), as information flows may be skewed in organizations (Reitzig and Sorenson, 2013; Reitzig and Maciejovsky, 2014). Consequently, an intention to improve the firm's response capability by responding faster to emerging changes could start with studying the quality of the knowledge sources of the firm's key stakeholders at the periphery e.g., frontline employees and customers.

As it has been briefly alluded to in this introductory section, frontline employees should be able to collectively predict firm performance with high accuracy. Moreover, this implicates that they also can predict changes in performance, and their underlying causations, which implies that they could be utilized as an informational resource in strategic issue management. Several complementary explanations are provided in the present dissertation for the strategic utility of aggregated judgmental forecasts from frontline employees: (i) Due to the mathematical principles entailed in the notion of collective wisdom, aggregated forecasts built upon ability, diversity and independence will result in accurate forecasts, as the idiosyncratic noise will cancel each other out while the signal remains. (ii) As frontline employees are in an exposed position, they should be the first to detect impending changes. (iii) Frontline employees may be the first to identify early signals of issues *while they are still seemingly small.* (iv) Frontline employees may be better able to intuitively *'sense'* emerging issues, due to experiential tacit knowledge accumulated through day-to-day operations. (v) Frontline employees may have greater knowledge of customer needs due to frequent interaction with customers. (vi) Finally, frontline employees can link internal and external developments as they are boundary spanning. In combination, these dimensions each provide a piece to the expected predictive accuracy of frontline employees. However, the potential of frontline employees has traditionally been overlooked in SIM.

Part of the underlying reason for this lack of attention on frontline employees might lie in the fact that there are various valid reasons for why decision-makers do not incorporate frontline insights: In the work by Arrow (1974), it is posited that information has costs and, "… the scarcity of information-handling ability is an essential feature for the understanding of both individual and organizational behavior" (p. 37). Within a SID context it has furthermore been noted that, "adequately capturing the volume of information that can be gathered by a large

number of boundary spanning personnel presents difficulty associated with information overload for the organization" (Potter and Lipinski, 2009, p. 167). Moreover, studies have shown an inverse relationship between power and perspective taking (Galinsky, Magee, Inesi, and Gruenfeld, 2006), suggesting that the managerial position in itself inhibits the incorporation of different views. Hence, there should be a potential in the collective wisdom of frontline employees in aggregated judgmental forecasting for use in SIM. As little empirical research has followed up on Ansoff's (1980) initial paper, using the collective wisdom of frontline employees may advance and extend the SIM concept within the strategy literature.

1.6 Research questions(s)

The preceding review of the various literary streams on forecasting in strategy, strategic responsiveness, interactive strategy, strategic issue management and collective wisdom suggests that there is a paradoxical stance in the literature on strategic issue management.

This paradoxical stance can be illustrated from a threefold explication: (i) As suggested by the literary stream on the learning school in strategy, key constituents such as frontline employees and customers gain updated experiential insights as they act on a daily basis. (ii) According to the mathematical principles detailed in the literature on collective wisdom, the frontline and customers (and other stakeholder groups from the organizational periphery) should be able to provide accurate forecasts if they are aggregated in line with the prerequisites for obtaining crowd wisdom. (iii) However, the literature on strategic issue management has traditionally overlooked the potential of aggregating judgmental forecasts on an ongoing basis from key constituents from around the organizational periphery, with the exploratory work of Hallin et al. (2012, 2013) being notable exceptions.

Consequently, the present project is motivated by a general research question searching for specific insights expressed in additional sub-questions related to each of the three papers comprised within the dissertation. The three questions addressed by the three distinct papers will, in conjunction, try to provide a coherent answer to the main guiding research question of the project. That is, the dissertation follows a progressive logic where the main research question is sub-divided into a number of individual studies that, in combination, provide pieces

to the general puzzle posed by the main research question. The research question(s) are illustrated below in table 1.5.

Table 1.5: Research question(s) in the dissertation.

Project RQ: To what extent can frontline employees and customers predict firm performance – and how can it be utilized in SIM?		
Paper 1 RQ: How can collective wisdom be utilized in SIM?	**Paper 2 RQ:** How does intended and emergent strategy processes interact over time in a hostile industry context?	**Paper 3 RQ:** To what extent can frontline employees and customers predict firm performance.

Source: Author's own creation

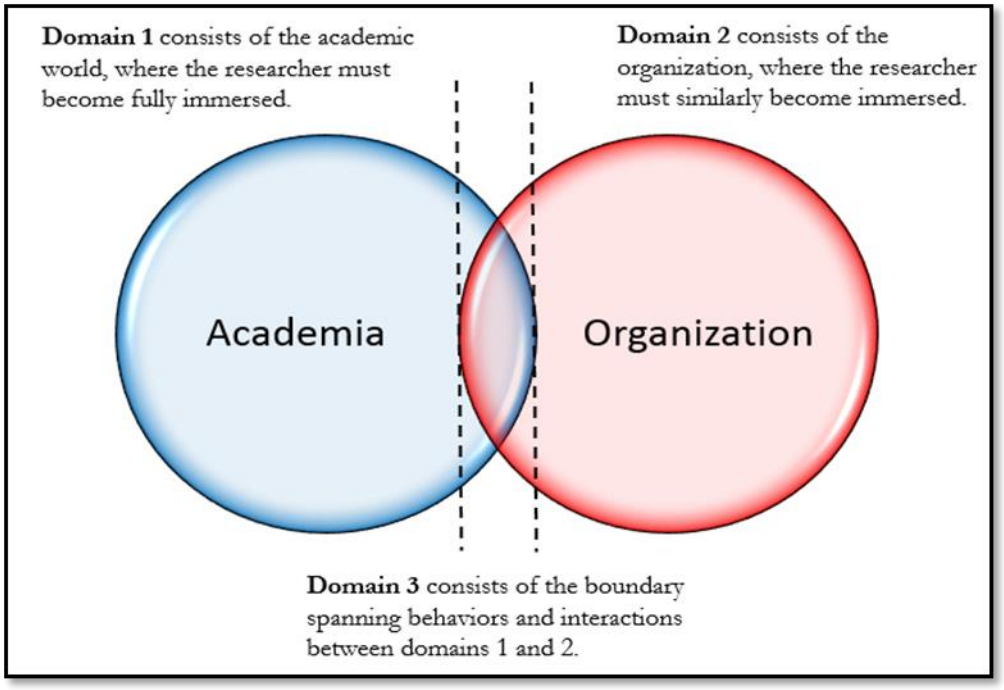
1.7 Empirical setting – reflections of an industrial PhD

As the research setting plays a pivotal role in the access to data and influenced various challenges experienced by the researcher while conducting the study, the contextual setting must be made explicit and critically reflected upon. This is particularly pertinent since the present dissertation is a result of the so-called industrial PhD program[2], where the researcher spends (approximately) half the time fulfilling a job position at the host company created for the purpose of supporting the PhD research project. An industrial PhD is a three-year research project and education, which is carried out in collaboration between the candidate, a host organization and a university. Accordingly, the candidate is simultaneously employed by the organization and enrolled at the university.

[2] The industrial PhD program is run by Innovation Fund Denmark. Further information about the program can be seen at: http://innovationsfonden.dk/en/application/erhvervsphd

This research set-up is fruitful and rewarding but also immensely challenging at same time. Part of the explanation for these paradoxical experiences can be explicated in the domains of the research project, which is evident from figure 1.3. As it can be seen from the figure, the industrial researcher, being employed in the organization in which he researches, must operate in 3 different domains.

Figure 1.3: The different domains of an industrial PhD.



Source: Author's own creation

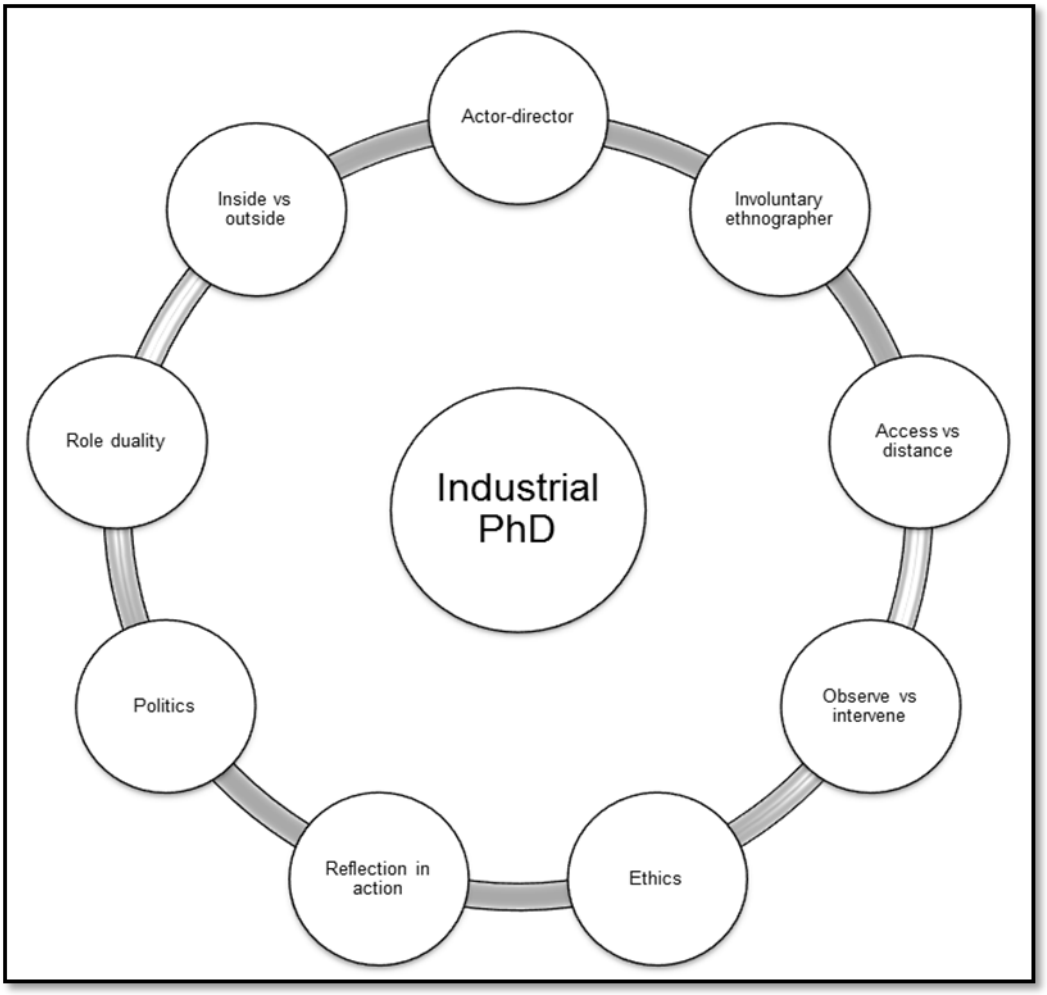
As evident in figure 1.3, domain 1 consists of the academic world, where the researcher must become fully immersed. This immersion entails the intellectual curiosity stimulated by ongoing debates within the relevant academic fields, academic rigor in methodology, values and norms including discipline, self-critical and reflective considerations with respect to the researcher's own experiential insights. Domain 2 consists of the organization, where the researcher is employed. Here the researcher must be fully immersed as an actor within the organizational context which entails gaining intricate insights into norms, values, practices, politics thus identifying with the organization. Domain 3 consists of the boundary spanning behaviors and interactions between domain 1 and domain 2. Domain 3 is particularly challenging, as domain 1 and domain 2 differ in terms of e.g., expectations, purpose and time

horizons. Where domain 1 may expect the researcher to be a detached onlooker, domain 2 may expect the researcher to be an active participant. Where domain 1 may be preoccupied with *what is true* in the project, domain 2 may be preoccupied with *what works* in the project. Hence, domain 3 is not only preoccupied with navigating under these diverging and conflicting rationales, but similarly entails an ambition to obtain symbiotic knowledge in this intersection, where *what is true* does not necessarily *work* – or more interestingly, *what works* is not necessarily *true*. These paradoxical instances may give rise to interesting research, where the researcher can further develop the academic field while simultaneously improving practice. Moreover, this dual improvement is obviously also apparent in the synergetic situation where *what works* in practice is similarly *what is true* from a theoretical point of view.

However, these 3 domains similarly give rise to various reflections that have remained somewhat elusive in the methodological literature. These reflections are illustrated in figure 1.4. As evident in the review of the 3 domains, particularly the issue of politics and the issue of the potential tension between observing versus intervening are prevalent in domain 3. Here, an understanding of politics (both organizational politics and politics between the organization and university) is a necessary prerequisite to being able to navigate in the boundary spanning behaviors that an industrial research project necessitates. Moreover, this political understanding is similarly necessary when there are mutual interactions between key people between the academic domain and the organizational domain as it helps translate and understand the behaviors and interests of the multiple constituents.

The tension between observing and intervening may similarly play a pivotal role in in these political interplays, where it often is valuable to combine the two, but at the same time stipulating up front what the research project should be framed as in order to have a common ground as a vantage point that could be referenced back to in the political dynamics which, undoubtedly, will shift during a research project.

Figure 1.4: Reflections of an industrial PhD.



Source: Author's own creation inspired by Coghlan and Brannick (2014), and Evered and Louis (1981)

The issues of inside versus outside perspectives, actor-director, role duality and reflection in action share several commonalities. The role duality is apparent in the chasm between being a detached onlooker and a participant observer, i.e., outside versus inside perspectives. Inquiry from the inside is characterized by the immersion of the researcher in the corporate setting to gain experiential insights and situational knowledge (Evered and Louis, 1981); in contrast, a detached researcher makes inquiries from the outside and validates the generalizability of nomothetic knowledge based on concrete measures and underlying logic. Evered and Louis (1981) suggest that the two modes together form a more appropriate inquiry by enhancing reflective choices among researchers in the face of intricate and ambiguous organizational settings.

Whereas it is challenging to pursue the two approaches simultaneously, the researcher took on the role of a participatory actor with an inside perspective, and sought the outside perspective by partnering up with external co-authors, as well as by reflecting critically on the experiential participant knowledge. This critical reflection can similarly be described in the metaphor of 'actor-director' in movies. Making films entails engagement in actions, dynamic patterns and relationships that are similar to participatory research in organizations, as the researcher may resemble an actor directing his own films by e.g., enacting a scene and subsequently return behind the camera to study it, critique it and making the necessary decisions in view of the updated insights gained from the scene (Coghlan and Brannick, 2014). As noted by Coghlan and Brannick (2014): "… the work of scholar-practitioners takes place in the present tense as they endeavor to change their organizations and to generate actionable knowledge" (p. 8). Hence, the industrial researcher, or actor-director, becomes preoccupied with doing research *in* action, rather than merely research *about* action. Consequently, the dual research requirements necessitate that the researcher is cognizant of the importance of reflection-in-action in the industrial research project.

This researcher's experiential understanding and strategy for collecting data, and analyzing it, was to equate the role of an industrial PhD as being a hybrid between action researcher and 'an involuntary ethnographer', because it has many commonalities with fieldworkers who are immersed in a setting and engaged in organizational fieldwork (Van Maanen, 1988). The concept of 'involuntary ethnographer' refers to the fact that an industrial PhD is, in essence, a fieldworker expressing realist, confessional and impressionist tales from the field (Van Maanen, 1988) albeit not necessarily being cognizant of the effect of the immersion before the project has been commenced. However, this similarly created various tensions. For instance, the unique access to the field necessitated that the researcher took additional actions in order to keep a certain amount of distance during the process: This was done by working with external co-authors who could maintain an exclusively 'outside' view, in addition to the researcher making sure that he got outside the field during periods of analysis and writing. Moreover, the role duality of being an 'involuntary ethnographer' similarly brought about ethical considerations that are not typically conveyed in methodology books: For instance, when being provided with casual and informal information or gossip from people within the organization, do they share it based upon the role of a colleague or of a researcher? This is one

example of the many complexities in the engagement and execution of an industrial research project. Having provided a brief overview of the many intricacies involved in doing an industrial PhD, the next section will explicate the methodological presumptions and data of the dissertation.

1.8 Methodological presumptions and data

The project's research approach and data collection were logically influenced by this researcher's presumptions concerning (i) the nature of strategy, and in particular, (ii) a process philosophical vantage point. Where the author's view on the nature of strategy has already been discussed, it is relevant to similarly explicate the underlying assumptions inherent in process philosophy, which (i) resonate with the author's view on strategy, and which (ii) shaped the empirical studies in the present dissertation.

At its core, process philosophy is preoccupied with an ontology of *becoming* rather than an ontology of *being*, which similarly suggests that change is the cornerstone of reality. In other words, 'being' is perceived as evolving and dynamic - and any investigation into reality needs to incorporate this dynamic nature of an evolving 'being' in order to fully comprehend reality. This means that, "ontologically, process philosophy views process, flux and transformation as the primary 'stuff' of reality" (Nayak and Chia, 2011, p.289). Accepting this premise necessitates that phenomena are observed as continuously evolving dynamics, and therefore, that phenomena are observed over longer periods of time, ideally by being immersed in these changing processes. These assumptions have affected the author's view of strategy in which strategy is seen as 'patterns in resource-committing decisions' (e.g., Bower and Gilbert, 2005, 2007), in addition to observing phenomena over longer periods of time in both empirical papers in the dissertation - a longitudinal qualitative case study in paper 2, and aggregated judgmental forecasts over consecutive time periods in paper 3.

This author was, as previously described, immersed in the research context throughout the three years of research, and was consequently able to observe, experience and act in the continuously evolving organizational processes of emergence and transformation. Moreover, the process perspective similarly influenced the main strategy scholars that are predominantly

drawn upon in the dissertation (e.g., Burgelman and Grove, 1996; Mintzberg, 1987; Quinn, 1980).

The data consisted of both qualitative (paper 2) and quantitative (paper 3) data that in combination provided different perspectives on the research topic. Albeit qualitative and quantitative methods have distinct strengths, combining the methods can have a complementary effect, where their individual limitations are partly addressed, and may provide a more complete understanding of social reality (Axinn and Pearce, 2006). Hence, mixed methods was utilized as "More often than not, a combination of qualitative and quantitative methods will do the task best" (Flyvbjerg, 2006, p. 242). Despite the different methodological approaches, both papers followed developments over time, as the researcher was immersed in the research context for 3 years. The researcher was a part of 5 different departments in 4 different business divisions at different points in time during the three-year period. Paper 2 draws upon data that is predominantly qualitative. Here, 13 semi-structured interviews were conducted in addition to casual participant observations of meetings and day-to-day activities, as well as archival data. Paper 3 relies on quantitative data, as the researcher collected 13,531 survey responses that entailed over 150,000 individual forecasts collected over 17 consecutive months.

In combination, the papers comprise an extensive empirically based research effort into the specific organizational context that provides complimentary perspectives. Consequently, abductive reasoning utilizing mixed methods constitutes the methodological core of the dissertation. This was chosen as it resonated with the author's presumptions about theory and epistemological approaches.

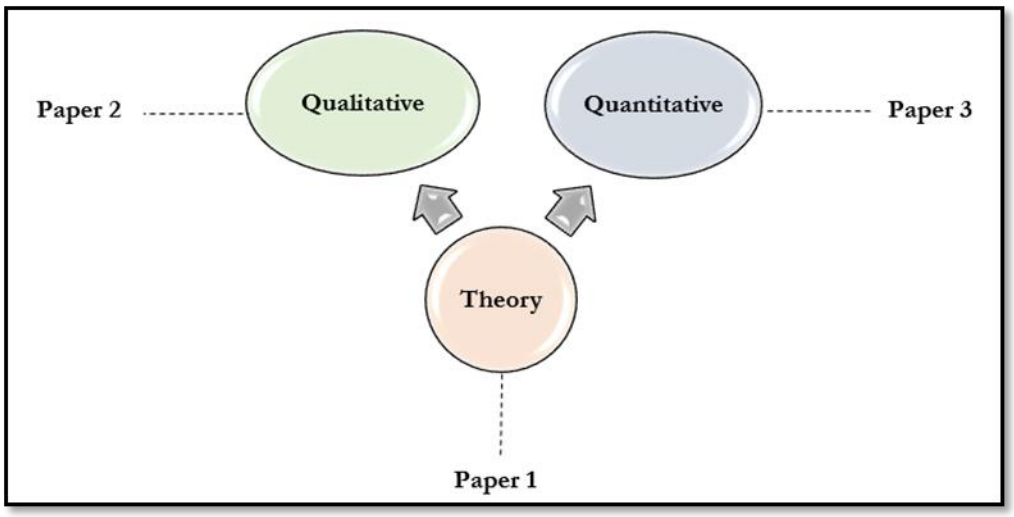
1.9 Dissertation composition and outline

The dissertation is comprised by three interrelated papers that progressively build upon and extend each other pursuing answers to the posed research questions. Albeit the three papers are interconnected, they similarly differ in their approaches (figure 1.5). That is, paper 1 is a conceptual paper that (i) reviews various literary streams, and (ii) synthesizes various points in propositions that comprise a model for the conceptualized approach. Hence, Paper 1 provides the theoretical vantage point for the two subsequent papers. Paper 2 is a qualitative paper that seeks to *understand* the various *processes* in which the researcher was *immersed* taking the form

of an *embedded single case study.* Consequently, paper 2 draws extensively on qualitative rationales and methods. In contrast, paper 3 is a quantitative paper that seeks to *measure* and *compare* the *predictive accuracy* of the aggregated judgmental forecasts of frontline employees and customers with respect to *firm performance.* Consequently, paper 3 draws extensively on quantitative rationales and methods.

However, these qualitative and quantitative papers are complimentary, as their distinct research questions and methods provide findings that together add up to inform the general research question of the dissertation. Moreover, the qualitative and quantitative papers both take *time* into account in their research designs that resonate with the process philosophical perspective of the research. So, although the three different papers have different typological classifications, they are tied together by commonalities in assumptions and a progressive structure that provide a complimentary logic to the broader dissertation.

Figure 1.5: The various typologies of the papers.

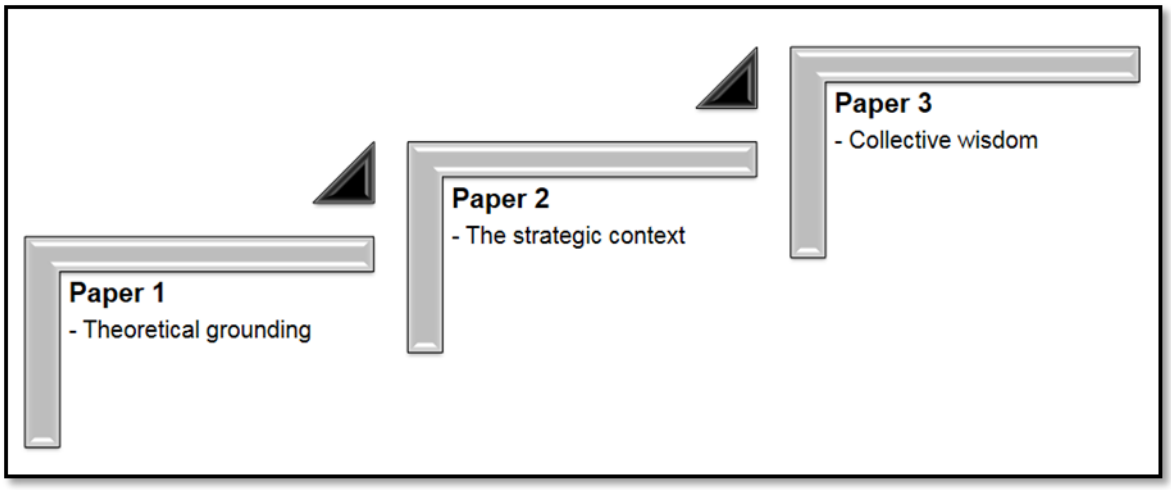


Source: Author's own creation

The dissertation pursues a progressive structure, as each of the papers build upon one another. This is illustrated in figure 1.6, which conceptualizes the progression as a staircase, where paper 1 provides a theoretical grounding underlying the empirical work, paper 2 explicates the strategic context of the empirical work, and paper 3 seeks to measure the predictive accuracy, or collective wisdom, of the frontline. Put differently, paper 3 tests the

theoretical propositions laid out in paper 1 – within a context depicted in paper 2. Moreover, paper 1 argues for a balance between strategy-making processes and collective wisdom – where paper 2 focuses on strategy-making processes, and paper 3 focuses on collective wisdom. Hence, there are clearly interconnected links between the three papers.

Figure 1.6: The progressive structure of the papers.



Source: Author's own creation

Taking this model of the progressive logic of the dissertation as a point of departure, the three papers will now be briefly outlined. All three papers have strategy scholars and practitioners as their main audiences. However, the papers and their findings are similarly expected to resonate with and contribute to audiences interested in the organizational/managerial use of dispersed knowledge. Hence, important secondary audiences consist of scholars and practitioners interested in collective wisdom, judgmental forecasting, knowledge management – and management science in general, given the basic dichotomy between the organizational center and periphery. The following will provide summaries of the main elements and findings from the three papers to provide the contours of the results, contributions and proposed model of the dissertation. This brief review is not meant to be a comprehensive explication of the papers, but merely to provide a general overview.

Paper 1 is a conceptual paper reviewing various literatures with the purpose of synthesizing insights into specific propositions that together frame an organizational approach

towards utilizing the collective wisdom of the organizational periphery in strategic issue management (SIM). The summary of the paper can be seen in table 1.6.

Table 1.6: Summary of paper 1.

ELEMENT	CONTENT
PURPOSE:	• Develop a conceptual model for using the collective wisdom of frontline employees and customers in strategic issue management.
BACKGROUND:	• Recent studies have indicated that they are some of the first to identify emerging issues, but they are rarely probed about their insights.
METHODOLOGY:	• Conceptual argument drawing on different literary streams.
FINDINGS:	• Drawing on insights from crowd wisdom, interactive strategy-making and strategic issue management, it is possible to create a model for using collective forecasts from frontline employees and customers to identify early signals of emerging strategic issues.
MAIN CONTRIBUTION:	• It provides theoretical propositions and frames the contours for an organizational model using collective wisdom to predict emerging issues.
IMPLICATIONS:	• Points towards the potential of cross-fertilizing strategy and crowd wisdom. Moreover, it draws up the contours of an organizational approach which may have both academic and managerial implications.

Paper 2 (table 1.7) is a qualitative paper that seeks to understand the intricate interaction between intended and emergent strategy processes over time in a competitive industry context.

Table 1.7: Summary of paper 2.

ELEMENT	CONTENT
PURPOSE:	• Obtain a (better) comprehension of how intended and emergent strategy processes interact over time at different locations and levels in a particularly hostile industry context.
BACKGROUND:	• Large body of literature explicating the prominence of the two modes, but our understanding of how they interact in different contexts are limited.
METHODOLOGY:	• Qualitative – case study – field research – interviews.
FINDINGS:	• The dynamic competitive pressures combined with a strong corporate legacy cause strategic initiatives to primarily emerge as deliberate actions induced by the strategic apex around top management. • The organizational setting fosters managerial maverick behavior with disregard for formal rules to turn autonomous initiatives into viable strategic ventures.
MAIN CONTRIBUTION:	• Our findings illustrate that a highly competitive and hostile context conditions a process of reduced organizational slack in the form of time and human resources that makes it difficult for organizational members to take and engage in autonomous initiatives.
IMPLICATIONS:	• In short, the two feet of strategy-making, deliberate and emergent, seem to display different cadences under different contextual conditions cautioning a more nuanced view on the complex interactive strategy-making process.

Following paper 2, the dissertation will move on to the quantitative paper 3, which seeks to measure the predictive accuracy of key constituents who operate around the organizational periphery. The paper outlines empirical results which suggest the usefulness of aggregated judgmental forecasts from frontline employees in the SIM process. The summary of paper 3 can be seen in table 1.8.

Table 1.8: Summary of paper 3.

ELEMENT	CONTENT
PURPOSE:	• To test if the collective wisdom of frontline employees and customers entail predictive accuracy and can be used in strategic issue management.
BACKGROUND:	• Recent studies have indicated that they are some of the first to identify emerging issues, but they are rarely probed about insights.
METHODOLOGY:	• Quantitative – surveys – distributed lag models – equivalence tests.
FINDINGS:	• Call center employees are able to predict various performance measures – the same accuracy is not seen among the customer respondents.
MAIN CONTRIBUTION:	• It provides quantitative evidence for the predictive accuracy of call center employees – and in this case, they outperform customers at forecasting.
IMPLICATIONS:	• The results suggest that the collective wisdom of call center employees is indeed true i.e. they comprise 'proof-of-concept'. • The results indicate that call center employees might be able to provide quite accurate insights about customer satisfaction. This was not seen among the customers themselves. • The results point towards the usefullness of an interactive model of strategic issue management and diagnosis.

This dissertation is divided into 5 chapters. After this introduction (chapter 1), the subsequent chapters will be comprised by the various research papers. Chapter 2 will be comprised by paper 1; chapter 3 will be comprised by paper 2 – and chapter 4 will be comprised by paper 3. While each chapter (i.e., paper) individually addresses a unique purpose and contribution to the literature, combined the chapters enhance our understanding of the main research question of the dissertation, by framing an organizational approach using collective wisdom from key constituents around the organizational periphery to identify emerging issues that update top management about ongoing developments that necessitate managerial attention. Finally, chapter 5 summarizes and discusses the findings while answering the main research question of the dissertation. Moreover, the chapter will similarly discuss contribution(s), limitations and implications of the research.

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CHAPTER 2

DETECTING AND EXPLOITING EARLY SIGNALS: USING COLLECTIVE WISDOM IN STRATEGIC ISSUE MANAGEMENT[3]

CARSTEN PEDERSEN

Abstract

In dynamic environments, competitive advantage lies in developing actionable knowledge from continuous streams of unstructured data to discern the contours of the evolving competitive landscape. Recent studies indicate that certain key stakeholders, such as frontline employees and customers, are among the first to observe emerging issues of strategic importance to the firm. Yet, they are rarely probed to obtain updated information about emerging strategic issues. The present paper develops a conceptual model to detect early signals drawing on insights from collective wisdom, interactive strategy-making, and strategic issue management. This frames an organizational approach using collective wisdom to identify emerging issues that updates top management about ongoing developments for active engagement in the execution of adaptive initiatives.

Keywords: collective wisdom, interactive strategy, strategic issue management, learning

[3] Earlier versions of this paper have been presented at Strategic Management Society Conferences in Copenhagen (see Pedersen, 2014) and Madrid.

Introduction

In dynamic environments, strategic advantage relies on the ability of firms to observe environmental changes as they evolve to enable early strategic responses (Ansoff, 1975, 1980; Dutton and Duncan, 1987; Eisenhardt, 1989; Lovas and Ghoshal, 2000; Schoemaker and Day, 2009; Stacey, 1995; Teece, 2007). Previous studies suggest that frontline employees and certain groups of customers should be among the first to sense emerging events, as they often act on a daily basis and therefore gain unique experiential insights about the firm's ability to perform its day-to-day activities (Burgelman and Grove, 1996, 2007; Christensen, Anthony, & Roth, 2004; Hallin, Tvetteraas and Andersen, 2012; von Hippel, 2005). According to the commonly cited rationale of collective wisdom, here defined as situations where the collective output is more accurate than the average individual inputs that comprise the group, aggregated judgmental forecasts by key stakeholders from around the organizational periphery should be accurate if they are based on independence, diversity and knowledgeable insights (ability) as these are the prerequisites for obtaining collective wisdom (Larrick, Mannes, & Soll, 2012; Page, 2007a; Surowiecki, 2004). Yet, these stakeholder groups are rarely probed to identify and assess strategic issues that are critical for early responses and effective adaptation of organizational activities. For instance, studies of internal communication flows have shown that customer service employees tend to be overlooked by decision makers which, in turn, may result in suboptimal outcomes (Pentland, 2014). We know that fast effective decisions in high-velocity industries use comprehensive analyses based on diverse updated information (Eisenhardt, 1989) but little research is conducted to uncover specific approaches to aggregate peripheral information to identify emerging strategic issues, with Hallin, Tveterås and Andersen (2012, 2013) as notable exceptions. Eisenhardt and Martin (2000) distinguish between moderately dynamic and high velocity environments and they posit that dynamic adaptive capabilities in high velocity environments depend on real time information from interacting individuals. Hence, the present paper seeks to build upon this argument by developing a conceptual framework to exploit peripheral insights for use in strategic issue management (SIM).

Several studies have explicated how detailed knowledge of operating conditions is held among lower-level employees (Andersen, 2004; Bower and Gilbert, 2007; Burgelman and Grove, 1996; Dutton and Ashford, 1993; Hallin et al., 2012, 2014; Mintzberg, 1990a). Bower and Gilbert (2007) argue that strategy is formed by a series of resource-committing decisions

made by individuals throughout the organization that in many cases fail to reflect the plans of top management. In a similar vein, Burgelman and Grove (1996, 2007) argue that alternative actions taken by lower-level employees can become useful responses to strategic inflection points. Similarly, Teece (2007) suggests that the firm is vulnerable if the environmental sensing is left to a few individuals within it. Hence, it is posited that lower-level employees have a better sense about ongoing changes and that this information can be used to inform the strategy-making process in high velocity environments.

As frontline employees and customers are in a better position to sense distinct knowledge about changes in the firm's operational conditions, they constitute good sources to inform considerations about responses to emerging developments (Burgelman and Grove, 1996, 2007; Mintzberg, 1987, 1994; von Hippel, 1988, 2005). The present paper argues that updated insights from these key stakeholders operating around the organizational periphery should be collected and considered in the SIM process, as a potential for double-loop learning among managers (Argyris, 1976). That is, aggregated judgmental forecasts by peripheral stakeholders can be utilized to modify or reject a goal. The paper introduces a conceptual model that describes how forecasts of firm performance by key stakeholders can be aggregated and used to identify strategic issues, i.e., internal and external events that can influence firm performance (Ansoff, 1980; Hallin et al., 2012, 2013). The aggregated judgmental forecasts by key stakeholders can fuel strategic issue diagnosis (Ansoff, 1975; 1980; Dutton and Ashford, 1993; Dutton and Duncan, 1987; Dutton, Fahey, and Narayanan, 1983) and thereby help the firm to make better adaptive moves. Put differently, aggregated judgmental forecasts can foster double-loop learning enabled by an interaction between the center and periphery (Argyris, 1976), where the strategic reasoning of the central apex can be updated by ongoing local experiences gained by frontline employees and customers acting around the organizational periphery.

This conceptual paper adds new understanding to the strategic potential of cross-fertilizing the concepts of SIM and collective wisdom. The study contributes to the literature in several ways. First, using collective wisdom from the periphery in SIM is not yet well-developed (Ansoff, 1980; Dutton and Duncan, 1987; Hallin and Andersen 2014), so the conceptualized model provides a theoretical vantage point into the cross-fertilization of these literary streams. Second, the paper contributes by arguing that using aggregated judgmental forecasts in SIM processes may stimulate double-loop learning within the organization (Argyris, 1976). As the

model that we propose utilizes peripheral groups to identify emerging issues which managers can help resolve, it stands in contrast to conventional crowd models where management frames a task that the crowd subsequently solves. However, this requires a learning process to take place at the upper echelons. Moreover, it is argued that this interactive learning potentially has superadditive effects. Thirdly, the study deals with crowd wisdom within a context entailing organizational processes and managerial mindsets i.e., through a holistic and process-based perspective. This differs from most studies researching crowd wisdom, as it seeks to balance aspects of collective intelligence and managerial decision making. Finally, the paper contends that the proposed approach reconciles central and peripheral processes, along with intended and emergent processes, as the use of crowd wisdom in SIM utilizes a central and intended process for making use of emergent peripheral insights. Hence, it bridges the seminal wedge between planning and learning approaches to strategy.

The paper develops a theory to explain why and how the aggregated judgmental forecasts of frontline employees and customers can provide early signals of emerging issues and why managers at the strategic apex are instrumental in using this information to orchestrate adaptive responses. Where the evolutionary view of strategy formation puts a distinct emphasis on individual actions (Lovas and Ghoshal, 2000), we also ascribe an important role to top management in orchestrating proper responses to emerging strategic issues identified by employees and customers. The first part of the paper provides an overview of the theoretical rationale of the proposed approach to SIM. The paper then discusses the study's contribution to the strategy literature and limitations while proposing directions for future research.

BACKGROUND

Many contemporary environments have been described as nonlinear, unpredictable, and driven by uncertainty (Andriani and McKelvey, 2009; Ansoff, 1975, 1980; Schoemaker and Day, 2009; Silver, 2012). Eisenhardt and Martin (2000) distinguish between moderately dynamic and high velocity environments. In high velocity environments, dynamic adaptive capabilities rely on real time information from interacting individuals (Eisenhardt and Martin, 2000). Hence, firms may obtain superior performance in high velocity environments, if they are able to early detect, interpret, and act on weak ambiguous signals of impending issues. Albeit organizations and industries vary in terms of their resources, structures, and appropriate strategy-making approaches, it is argued that - especially among large organizations in dynamic

environments - increasing external complexity tends to be mirrored in internal complexity: This poses an inherent strategic paradox in large organizations operating in high velocity environments, as evolving environmental conditions create a need for increasing organizational adaptation, but internal complexities such as intricate and time-consuming decision processes both delay responses and act as a barrier for fostering the needed responses. The internal complexities and increasing specialization result in a knowledge gap between the strategic apex and the organizational periphery, which suggests a pressing need for ongoing interaction and communication between these relevant constituents at the center and the periphery.

Hence, the following will further detail why using aggregated judgmental forecasts by key constituents from around the organizational periphery in SIM processes may constitute a fruitful trajectory. A SIM system is "a systematic procedure for *early* identification and *fast* response to important trends and events inside and outside an enterprise" (Ansoff, 1980, p.134). Albeit previous studies have suggested the use of crowds of key stakeholders in sensing strategic issues (Hallin *et al.*, 2012, 2013, 2014), and the difficulty of managers in detecting early signals of emerging issues has been explicated (Schoemaker and Day, 2009), these related aspects have rarely been dealt with in combination. Therefore, the present paper takes a more holistic and process-based view on utilizing crowd wisdom in SIM. This could provide a needed perspective on the latent opportunities and potential challenges of utilizing crowd wisdom to predict emerging issues, as crowd predictions must interact with organizational processes and managerial mindsets to obtain the desired outcomes.

The proposed approach of the present paper differs from the model suggested by Schoemaker and Day (2009), as it utilizes peripheral crowd wisdom to *sense*, and not only help *interpret*, early signals of emerging issues. In the rationale of Schoemaker and Day (2009) 'peripheral' refers to peripheral vision, and not the organizational periphery – albeit the two could arguably be combined. Whereas Schoemaker and Day (2009) acknowledge that crowd wisdom could be utilized in the process of detecting early signals of impending events, they do not suggest that crowd wisdom should be utilized to sense the issues, but only to interpret identified signals. The difference has important practical implications, as the former lets the crowd sense and define the issues, whereas the latter would necessitate that managers sense and frame the signals that the crowd should subsequently assess. According to Ansoff (1980), "An

issue may be a welcome issue, an *opportunity* to be grasped in the environment, or an internal *strength* which can be exploited to advantage. Or it can be an unwelcome external *threat*, or an internal *weakness*, which imperils continuing success, even the survival of the enterprise" (p. 133). The present paper argues that strategic responses relying on collective wisdom should let peripheral crowds sense and detect impending strategic issues, whereas central managers are needed to provide a timely and coordinated response to the changes. Here, the obstacle arises when the peripheral sensing *challenges* the dominant logic of managers. In dynamic environments, the dominant logic of managers is expected to lag behind market changes, and it is therefore essential that collective predictions from the periphery guide the process and that central decision makers are open and receptive to absorb this information. It is exactly this peripheral-driven process that is able to lead to double-loop learning among managers (Argyris, 1976), as it challenges managerial assumptions that may quickly become obsolete in an evolving environment.

In order to deal with uncertain events, firms could rely on aggregated judgmental forecasts rather than probabilistic scenarios, because many new and unknown things are evolving. In a Knightian perspective, *uncertainty* differs from *risk* in that risks can be described as probabilistic outcome distributions whereas uncertainty cannot. While uncertainty is difficult to manage, it is also the source of economic value creation (Andersen, Garvey and Roggi, 2014). Consequently, there is upside potential to conceiving management approaches that effectively take advantage of true, or Knightian, uncertainty. This would, however, require an intricate interaction between teleological and non-teleological strategy approaches. Hence, there is a need for management approaches that utilize the entire firm to effectively incorporate and take advantage of true uncertainty. The conceptualized management approach seeks to meet this challenge, and it builds on and extends Ansoff's (1980) thoughts, while being aligned with Rerup's (2009) attention to the importance of weak signals from various organizational levels.

Using Distributed Intelligence to Predict Strategic Issues

In contrast to periodic management systems that are typically revised annually, SIM is 'real time' continuous preoccupation with strategic issues throughout the year. Hence, it is ongoing surveillance of 'fast' issues that may arise internally or externally in between reviews: According to Ansoff (1975, 1980), a strategic issue is an event that has a significant

performance impact on the firm. The domain subsumed by an 'issue' is likely to be broad, diffuse, and ill-defined – particularly in its early stages (Dutton and Duncan, 1987; Dutton *et al.*, 1983). Hence, it is important to respond to weak signals in order to be able to make a timely response (Ansoff, 1975, 1980; Ansoff and Sullivan, 1993).

The timeliness of firm responses is dependent on the interaction between the forecasting horizon and the time required by a firm to select and implement its response (Pedersen, 2014). As noted by Ansoff (1975), "firms often fail to anticipate and suddenly discover that a fleeting opportunity has been missed or that survival of a product line is threatened. Typically, at the 'moment of truth' neither the causes nor the possible responses are clear; the firm confronts an unfamiliar and often threatening event" (p. 22). This means that organizations should become skilled in recognizing weak signals and properly interpreting them (Schreyögg and Kliesch-Eberl, 2007). Organizations can benefit from taking a collective view on weak cues in order to foster organizational learning from crises (Rerup, 2009). As noted by Rerup (2009), disparity in attention to issues across the organization and a managerial inability to coherently attend to weak signals may result in unexpected crises.

The underlying rationale builds on enabling an interactive informational dynamic between the central apex and the organizational periphery, as illustrated in figure 1: Key constituents operating around the organizational periphery could arguably be the first to sense emerging issues of strategic importance, as they are the most exposed to change. Here, the organizational periphery is defined as the organizational boundaries around which internal and external stakeholders interact on an ongoing basis around firm-environment touch points: Stakeholders engaged in the firm's daily operations build up experiential insights, which could subsequently be aggregated by the central apex. As noted by Burgelman and Grove (1996), "it is wise to keep in mind that when spring comes, snow melts first at the periphery: That's where it is most exposed" (p. 11). Hence, knowledge networks increasingly appear throughout and around firms rather than being narrowly confined to upper management: Thus, "Employees are now responsible for adaptive capability rather than just being bodies to carry out orders" (Costanzo and MacKay, 2009, p.31).

--- Insert Figure 1 about here ---

As strategic planning has often separated thinking from doing (Mintzberg, 1994; Mintzberg *et al.*, 1998), experience-based learning has typically been ignored in top-level decision making. This is unfortunate, as there are many examples of strategic renewal and innovative initiatives emerging from the organizational periphery (e.g. Bower and Gilbert, 2007; Burgelman and Grove, 1996; Chia and Holt, 2009; Miller and Wedell-Wedellsborg, 2013; Mintzberg, 1994). In addition, experiential insights from the periphery should be more updated than conventional diagnostic control systems.

Figure 2 juxtaposes peripheral learning with central learning (Pedersen, 2014). Figure 2 is a conceptual model that is inspired by Andersen's (2013, 2014, 2015) argument for collaborative learning that combines the long learning cycles of the central apex with the short learning cycles from the organizational periphery, and Page's (2007b) emphasis on the potential benefits in the superadditivity of diversity: In the model central learning is characterized by long feedback cycles of planning followed by eventual outcomes, and peripheral learning is characterized by relatively short feedback cycles entailing peripheral actions followed by immediate results (Andersen, 2015; Pedersen, 2014). This suggests that the experiential insights obtained around the organizational periphery can be more updated than those encountered at the central apex. As noted by Andersen (2014, 2015), the two types of learning loops can be combined within a system of collaborative learning. Hence, these individual learning loops may be combined to create superadditivity, where $f(x+y) \geq f(x) + f(y)$ (Page, 2007b), as central learning is combined with peripheral learning to create interactive, or superadditive, learning. This means that the combination will create more than the sum of its parts, as the interaction itself constitutes a novel learning process, i.e., the two individual learning processes in combination create a third. The model below therefore emphasizes the superadditive benefit of having diverse lines of sight, as this aspect is not made explicit in Andersen's (2015) original model, albeit it is an inherent mathematical effect. Not only is the model itself superadditive, more importantly, combining diverse insights from the center and periphery on how to react to emerging issues could create superadditive solutions (Page, 2007b), where one insight from the periphery could be combined with another strategic assessment from the central apex to form a third idea that entails both updated experiential insights and strategic considerations.

Superadditive learning similarly reflects the potential double-loop learning taking place in the firm.

--- Insert Figure 2 about here ---

It is generally assumed that strategic planning should be the domain of the top management team, and that attention toward short-term operational execution should remain the domain of line and functional managers (Mintzberg, 1998). However, recent studies have propagated integrative approaches to strategy making, where central and decentralized processes are depicted as complementary strategy modes (Andersen, 2004, 2009, 2015; Andersen and Minbaeva, 2013). The conventional strategic management model comprises rational and analytical decision-making approaches which constitute the central strategy-making process that sets the direction, intent and aspirations of the company. In contrast, the ability of middle managers and lower-level employees to take action in view of emerging events constitutes a decentralized strategy process (Burgelman and Grove, 1996, 2007; Mintzberg, 1990; Mintzberg and Waters, 1985; Mirabeau and Maguire, 2014).

Research suggests that effective organizations engage in integrative processes (Hill *et al*., 2000), and some industries have developed modes of strategic thinking conducive to planned emergence, i.e., integrating central and decentralized processes (e.g., Grant, 2003). An explication of the elements within this integrative strategy process would explain why it could be advantageous to rely on collectively predicted issues from the organizational periphery. Hence, the following will explicate the inherent rationale of the elements comprising the interactive strategy modus operandi.

How Does the Central Apex Develop Strategies?

The conventional perspective in strategy-making has been that strategy formation is a conscious, rational and analytical process in which central management decides on an appropriate direction linked to clear objectives (Andrews, 1971; Ansoff, 1965; Chandler, 1962; Mintzberg, 1987, 1994; Mintzberg *et al*., 1998). Hence, the process often assumes a teleological and causal logic, where the central apex can predict and decide on the most appropriate strategy to meet the desired objectives. As noted by Mintzberg (1987), "Imagine someone planning

strategy. What likely springs to mind is an image of orderly thinking: a senior manager, or a group of them, sitting in an office formulating courses of action that everyone else will implement on schedule" (p. 66). Within this perspective, the central apex is often depicted as setting the strategic direction by issuing declarations of intent, formulating official policies and investing in specific projects. This rationalistic top-down logic of corporate strategy can be traced back to Alfred Chandler (Hoskisson *et al*., 1999; Whittington, 2008), who distinguished between *formulation*, where top management outlines the strategy, and *implementation*, where lower-level employees execute and carry out the strategy (Andersen, 2013; Chandler, 1962; Hoskisson *et al*., 1999).

This line of reasoning has been the predominant way to think about strategy, as exemplified by the design, planning and positioning schools of strategy formation, i.e., the 'prescriptive' schools of thought (Mintzberg, 1990; Mintzberg *et al.*, 1998). The design school describes an approach to strategy that focuses on the managerial process of the inception of the strategy, where the internal situation of the organization is used to match the external environment in a conscious manner (Mintzberg, 1990; Mintzberg *et al.*, 1998). In this school of thought, a key role in strategy formation is played by the board of directors and especially by the chairperson. The planning school accepts the premises of the design school except for two (i) that the process is informal, and (ii) that the chief executive is the key actor (Mintzberg, 1994). In this perspective, strategy formation consists of developing, formalizing and implementing an explicit plan that is developed by planners in a staff division (Mintzberg, 1994; Mintzberg *et al.*, 1998). The positioning school is often implicitly assumed to follow the same assumptions as the planning school, but focuses on the content of the strategies (Mintzberg *et al.*, 1998).

When a top-down approach to strategy is pursued, managers tend to rely on diagnostic control systems to monitor and control the execution and implementation of the strategy (Simons, 1990, 1991, 1994, 1995). As Simons (1995) argues, "Diagnostic control systems work like the dials on the control panel of an airplane cockpit, enabling the pilot to scan for signs of abnormal functioning and to keep critical performance variables within preset limits. Most businesses have come to rely on diagnostic control systems to help managers track the progress of individuals, departments, or production facilities toward strategically important goals" (p. 81). In other words, this approach assumes that the central apex can set a direction, and then monitor how well the organization progresses on the desired trajectory, by making use of

diagnostic control systems that track how well employees carry out the strategy (Simons, 1990, 1991, 1994, 1995).

Thus, the purpose of accounting and control systems has traditionally been to guide an organization toward meeting its pre-defined objectives (Davila, Foster and Oyon, 2009), as the original view of control systems was that they were tools to implement goals coming out of the strategic planning process (Simons, 1995). Hence, well-designed diagnostic control systems keep deviations to a minimum. As Davila, Foster and Oyon (2009) note, "The thermostat metaphor – where an output measure is compared to the intended goal (temperature) to establish a feedback mechanism that controls the (heating) process – has often been used to illustrate this interpretation of control" (p. 282). Implicit in these conventional approaches to strategic planning is the premise that the world will hold still while a plan is being developed and stay on the predicted course while that plan is being implemented, i.e., the fallacy of prediction (Mintzberg, 1994; Sarasvathy, 2001, 2008; Steyaert, 2007). These are premises that often pose significant challenges for the people executing the predefined strategy down in the organizational ranks (Burgelman and Grove, 1996).

In other words, planning processes tend to convey teleological assumptions, whereas execution and implementation are often characterized as non-teleological activities. Hence, central planning can be explicated as following an ontology of being, whereas peripheral execution can be described as following an ontology of becoming (Steyaert, 2007). This has likewise been conceptualized as the difference between a causal and an effectual logic (Sarasvathy, 2001, 2008). Consequently, the implicit assumptions behind strategy formation and strategy execution may differ significantly (Chia and Holt, 2009; Sarasvathy, 2001), as strategy has historically distinguished between *thinking* and *doing* (Andrews, 1971; Chandler, 1962; Mintzberg, 1987). This makes it relevant to explicate how strategies are experienced around the organizational periphery, and how strategies can sometimes emerge from the periphery.

How Are Strategies Experienced Around the Organizational Periphery?

After the overarching plan has been formulated and conceived by top management, the next step in the prescriptive model of strategic management entails the organization's line and middle managers stepping in to ensure that the plan is executed (Andersen, 2013). The strategy which has been stipulated by the central apex is subsequently enacted, effectuated and experienced by individuals around the organizational periphery. The enacted strategy comes to

life in the daily interactions among frontline employees and customers. Whereas this logic can similarly be transferred to other stakeholder groups such as suppliers or unions, the present paper focuses on frontline employees and customers for parsimonious reasons, as they comprise the operating core of day-to-day business.

The frontline employees and customers of an organization are arguably often the first to sense what is happening, as they interact on a daily basis and therefore gain unique experiential insights about the firm's ability to perform its operational tasks and routines. The competitive context may change after top management has developed a strategy, and therefore, the planned strategy can rely on assumptions which have become outdated by the time it is being implemented (Eisenhardt, 1989; Mintzberg, 1994). In continuation of this, the CEO may often be the last to know of novel developments (Burgelman and Grove, 1996). Due to the short-cycled learning loops, it can be argued that key constituents operating around the periphery of an organization would be the first to realize and sense if the chosen strategic trajectory is ineffective or becoming obsolete because environmental changes require novel approaches from the organization.

This suggests that frontline employees (Hallin *et al.*, 2012) and certain customers (Christensen *et al.*, 2004; Christensen and Raynor, 2003; von Hippel, 1988, 1999, 2005) often have updated knowledge of the effects and developments of the chosen strategic trajectory. Hence, a micro to macro interaction may be observable, as individuals can sense emerging issues of importance to the organization. Deliberate strategy precludes learning once it is formulated and emergent strategy fosters learning – suggesting that *strategy-making walks on two feet* (Mintzberg and Waters, 1985; Mintzberg, 1987; Mintzberg *et al.*, 1998). In other words, important constituents such as employees and customers experience the effects of the chosen strategic path first-hand, and therefore, they have important knowledge about operational factors that may influence corporate performance.

As noted, conventional views on strategy presume a top-down initiated process, where the central apex sets the direction and employees execute it (Ansoff, 1965; Mintzberg, 1987, 1990a, 1994; Mintzberg and Waters, 1985). However, a seminal discussion within strategic management concerns the extent to which strategies evolve from lower-level 'autonomous' initiatives in the organization, as opposed to being initiated by the managerial top (Bower and Gilbert, 2005, 2007; Burgelman and Grove, 1996, 2007; Mintzberg, 1987, 1990a, 1990b, 1994;

Mintzberg and Waters, 1985). For example, some studies question whether strategy is a coherent plan conceived at the top, or if it is formed by a stream of individual commitments, not always in line with the plans of the top management team (Bower and Gilbert, 2007; Burgelman and Grove, 1996, 2007; Miller and Wedell-Wedellsborg, 2013; Mintzberg, 1987; Mintzberg and Waters, 1985; Mirabeau and Maguire, 2014). Mirabeau and Maguire (2014) use a model of emergent strategy formation where emergent strategy originates from autonomous strategic behavior and subsequently becomes realized as a consequence of mobilizing wider support to provide impetus and manipulating the context to legitimate the project by constructing it as consonant with the prevailing concept of strategy. Hence, the study illustrates how the effect of projects can evolve over time.

Thus, the *strategy as practice* perspective of strategy-making pursues the call from Johnson *et al.* (2003) for "an emphasis on the detailed processes and practices which constitute the day-to-day activities of organizational life *and* which relate to strategic outcomes" (p.3). This supports an activity-based view of strategy, where strategy-making is seen as an amalgam of activities from a multitude of people in different parts of the organization. In other words, strategy is something *people do* i.e., an activity (Johnson *et al.*, 2003). Chia and Holt (2009) promote a view of strategy as wayfinding, which involves knowing *as we go,* in contrast to the conventional presumption in strategy of knowing *before we go.* Wayfinding is a strategic approach pursued by a multitude of entrepreneurial companies and individuals e.g., Google; Richard Branson's initial trials with the airline industry and Muhammed Yunus' explorations which eventually resulted in Grameen Bank (Chia and Holt, 2009).

As strategic planning has often separated thinking from doing (Mintzberg, 1994), experience-based learning has typically been ignored by the top-driven view of strategy. This can force employees to create autonomous initiatives that go against managerial orders, i.e., creative deviance (Mainemelis, 2010; Pedersen, 2014). However, emergent strategies often happen in a more subtle manner, where responses –or reactions to actions- drive experiences from actions that form a basis for learning and thinking. This is exemplified by Mintzberg (1987), who explains that, "Out in the field, a salesman visits a customer. The product isn't quite right, and together they work out some modifications […] after two or three more rounds, they finally get it right. A new product emerges, which eventually opens up a new market. The

company has changed strategic course" (p. 68). The example illustrates how seemingly minor improvements may turn out to have substantial strategic implications (Andriani and McKelvey, 2009; Holland, 2002) fostered through learning-by-doing.

In a related line of work, Miller and Wedell-Wedellsborg (2013) propagate what they refer to as 'stealth innovation', arguing that it is often better if lower-level employees innovate 'under the radar' without any interference from the managerial top. Going to the top for permission can kill the initiatives as the default answer is 'no', making the organizational spotlight of top management attention a bad place for unproven ideas. According to Miller and Wedell-Wedellsborg (2013), a better alternative is to innovate two levels below the C-suite. These ideas of shadow innovations resonate with the concepts of autonomous initiatives (Burgelman and Grove, 1996, 2007), emergent strategy (Mintzberg and Waters, 1985), informal innovation (Hartmann and Hartmann, 2015), and creative deviance (Mainemelis, 2010). As noted by Miller and Wedell-Wedellsborg (2013): "While aiming to deliver some quick wins is excellent advice […] the nature of your idea may be such that doing so is simply not possible. By starting your project in stealth mode, you can postpone the moment that the clock starts ticking for your idea" (p. 5).

Consequently, central management may think of strategic thinking as an activity that entails learning-by-doing and encompasses the entire organization. As noted by Mintzberg (1994), such strategies "… must be free to appear at any time and at any place in the organization, typically through messy processes of informal learning that must necessarily be carried out by people at various levels who are deeply involved with the specific issues at hand" (p. 108). Hence, it should be evident that frontline employees and customers may have important insights for the central apex, as they first hand effectuate and experience the effects of the chosen strategies and activities (Andersen, 2013; Chia and Holt, 2009). This accentuates the managerial necessity of taking advantage of distributed intelligence by utilizing the insights of actors operating in the periphery of the organization.

Integrating Central and Peripheral Processes

As the previous sections have shown, there are strong arguments for both a designed top-down driven strategy and bottom-up approaches of an emergent character. However, reality is most likely comprised by a complex interrelationship between the two that intricately

interweave central and peripheral processes (Andersen, 2004; Brews and Hunt, 1999; Burgelman and Grove, 1996, 2007; Grant, 2003; Mintzberg, 1987, 1994). Communication and learning could ideally take place in an ongoing interaction between central and peripheral actors. Interactive strategy-making could therefore combine central long-cycled learning and peripheral short-cycled learning.

A practical reality entailing both central top-down planning of intended strategies and peripheral bottom-up effectuation that may foster emergent strategies and innovative initiatives has long been propagated (e.g., Andersen, 2015; Mainemelis, 2010; Mintzberg, 1987, 1990a; Mintzberg and Waters, 1985; Mirabeau and Maguire, 2014). In contrast to the paradigm of the post-bureaucratic organization, research has shown that particularly R&D is less decentralized than contemporary accounts suggest (Hill *et al.*, 2000). Hill *et al.* (2000) therefore argue that effective organizations engage in more complex integrative processes. Similarly, Grant (2003) points to a possible reconciliation of the 'design' and 'process' approaches to strategy formulation, i.e., the process of planned emergence. Hence, the dual concerns have also been described as a potential resource (Andersen, 2004; Brews and Hunt, 1999; Burgelman and Grove, 2007), as integrative organizational processes may lead to superior financial results and risk outcomes. For instance, Andersen (2004, 2013, 2015) argues that integrative strategy-making combining decentralized responsive actions with central strategic planning is a winning combination, as a symbiosis between central strategic reasoning and local adaptive responses can be obtained, i.e., interactive/integrative strategy-making.

As it has previously been described, frontline employees and customers execute and experience the chosen strategies and their subsequent effect. Hence, they can observe the effect of the planned trajectory, and they can identify and observe emerging issues. The peripheral actors could arguably be better able to do this than central management, as they have more updated knowledge. In contrast, central management would arguably be the best at prioritizing integrated solutions, based on the peripheral actors' sensed issues and coordinated rational analyses.

While it may seem contradictory at first glance, top-down processes may symbiotically interact with bottom-up processes (Grant, 2003; Hill *et al.*, 2000). There is often a significant difference in the underlying assumptions of central planning and peripheral effectuation and experiences. Conventional top-down processes of the central apex often follow the prescriptive

schools of thought (Mintzberg, 1987, 1990a; Mintzberg *et al*., 1998) with a causal logic (Sarasvathy, 2001, 2008) and teleological models (Steyaert, 2007). Bottom-up processes follow an effectual logic (Sarasvathy, 2001, 2008) that is evident in non-teleological process models (Steyaert, 2007) and the so-called learning school of thought within strategy (Mintzberg *et al*., 1998).

Strategic renewal is built on activities of organizational learning, which has an inherent tension between exploration and exploitation (Burgelman and Doz, 2001; Crossan, Lane and White, 1999). As Crossan, Lane and White (2009) put it, "Renewal requires that organizations explore and learn new ways while concurrently exploiting what they have already learned" (p. 522). Similarly, continuous change necessitates that firms find a symbiotic balance in this dichotomy. Albeit a combination seems possible, the view has typically been that, "Innovation is associated with taking advantage of unexpected opportunities, exceptions, new relationships, uncertain outputs, risk and the possibility of failure. Tools designed to eliminate variation and control routine activities have little role in these settings" (Davila *et al*., 2009, p. 282). However, interactive management control systems have been argued as a possible solution to this paradoxical requirement (Simons, 1990, 1991, 1994, 1995). Therefore, central and peripheral processes may be complimentary within organizational learning and strategic renewal, as they together form an organizational response capability that can overcome the tension between exploitation and exploration.

The necessity of combining central and peripheral processes has long been highlighted, but often in slightly different ways (Brews and Hunt, 1999; Burgelman and Grove, 1996, 2007; Grant, 2003; Mintzberg and Waters, 1985). It has often been argued that strategic renewal derives from complimentary central and peripheral processes. For example, Mintzberg and Waters (1985) have explicated how real-world strategies lie on a continuum between deliberate and emergent – and that a mutual interplay between the two is the most common. Similarly, Burgelman and Grove (2007) propose that corporate longevity depends on both autonomous and induced strategy processes to different forms of strategic dynamics, and that the role of leadership is to balance these induced and autonomous processes. Burgelman and Grove's (1996) premise is that in extremely dynamic industries, "alignment between a firm's strategic intent and strategic action is not likely to last", and therefore, "new strategic intent must be based on top management's capacity to take advantage of the conflicting information generated

by strategic dissonance" (p.8-9). However, Grant (2003) sees planned emergence as a process in which strategic planning systems provide a mechanism for coordinating decentralized strategy formulation within a structure of demanding performance targets and clear corporate guidelines. Finally, Burgelman and Doz (2001) argue that long-term success in maximizing profitable growth requires developing new strategy-making capabilities, i.e., complex strategic integration, which makes leaders able to identify the *maximum-strategic-opportunity set.* This refers to those opportunities that can let companies fully exploit both their capabilities and their potential to pursue new strategies (Burgelman and Doz, 2001).

In conjunction with each other, these literary streams provide coherent support for the benefits of integrative strategy-making that can foster interactive learning, which has the potential to fuel double-loop learning in the organization (Argyris, 1976). Yet, integrative strategy-making necessitates appropriate information aggregation mechanisms and continuous interactive communication to succeed. Therefore, it is necessary to review the concept of the wisdom of crowds, and briefly, exemplify some common methods of information aggregation.

Collective Predictions from The Periphery

Whereas it should be clear that a collaborative relationship between central decision-making and peripheral predictions can be desirable, such an interaction requires appropriate mechanisms to aggregate dispersed knowledge. As Surowiecki (2004) states, "a decentralized system can only produce genuinely intelligent results if there is a means of aggregating the information of everyone in the system. Without such a means, there's no reason to think that decentralization will produce a smart result" (Surowiecki, 2004, p. 74). Hence, there is reason to argue that decentralization needs a certain amount of centralization to work effectively (Brabham, 2013), and that appropriate aggregation mechanisms are needed when pursuing this effort. Approaches such as crowdsourcing (Brabham, 2013; Howe, 2008), prediction markets (Luckner *et al*., 2012; Page, 2007b), preference markets (Soukhoroukova *et al*., 2007), and employee-sensing (Hallin *et al.*, 2012) all build on the wisdom of crowds, and are all mechanisms to aggregate dispersed insights from the periphery.

The wisdom of crowds here denotes the surprisingly accurate estimates that crowds can provide (Pedersen, 2014). As Surowiecki (2004) states, "under the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in them" (Surowiecki, 2004, p. xiii). The underlying logic of the wisdom of crowds posits that the average of a diverse

and knowledgeable crowd of independent individuals will be relatively accurate. The hypothesis is derived from mathematical principles which indicate that the crowd's prediction comprises signal-plus-noise, and subsequent averaging across predictions will both cancel out the noise while extracting the signal (Hong and Page, 2011; Page, 2007a; Pedersen, 2014; Suroweicki, 2004). Hence, "Collective wisdom, as we shall define it here, exists when the crowd outperforms the individuals that comprise it at a predictive task" (Hong and Page, 2011, p. 2). The wisdom of crowds is fueled by (i) diverse perspectives (ii) diverse interpretations (iii) diverse heuristics and (iv)diverse predictive models (Page, 2007a). Hence, wise crowds entail both expertise and diversity (Larrick et al., 2012).

Page (2007b) has shown that diversity trumps ability, as the best problem solvers likely have similar perspectives and heuristics, and therefore tend to get stuck in the same places. Hence, "when solving problems, diversity may matter as much, or even more than, individual ability" (Page, 2007a, p. 173). Within predictions, however, Page (2007b) has presented the diversity prediction theorem stating that diversity is *equally* important to ability. Consequently, this constitutes an argument for why central management should engage peripheral crowds of diverse perspectives. The underlying rationale of collective intelligence, or the wisdom of crowds, traces back to the seminal work of von Hayek (1945), Fama (1970) and Katona (1959, 1961). However, crowds may also lead to herding which may result in bad decisions (Hong and Page, 2011; Ottaviani and Sørensen, 2007). Consequently, it is posited that diversity and independence are essential when tapping into the wisdom of crowds (Hong and Page, 2011), as the best decisions and estimates are not built on consensus and compromise. Therefore, "the best way for a group to be smart is for each person in it to think and act as independently as possible" (Surowiecki, 2004, p. xx). This likewise indicates the difference that difference itself can make within a crowd, which underscores the value of diversity.

Markets have long been praised for aggregating information that is otherwise dispersed across agents in the economy (Hayek, 1945). More recently, interest in prediction markets as a forecasting method has seen a rise, popularized by the notion of the wisdom of crowds (Hong and Page, 2011; Luckner *et al.*, 2012; Surowiecki, 2004). Prediction markets are, "incentive-based mechanisms designed to pool information about future events" (Ottaviani and Sørensen, 2007, p. 554), and have been utilized by e.g., Hewlett-Packard, Yahoo! and Google. The theoretical foundation predominantly stems from von Hayek (1945), who considers the price

mechanism the most efficient instrument for aggregating asymmetrically dispersed information possessed by various market participants. The literary stream on prediction markets also rests on a foundation that stems from Eugene Fama's efficient market hypothesis (Luckner *et al.*, 2012). The efficient market hypothesis states that, "prices at any time 'fully reflect' all available information" (Fama, 1970, p. 383).

Albeit prediction markets, preference markets, crowdsourcing techniques, and surveys are all different mechanisms, they essentially share a common purpose: To utilize the potential of collective wisdom and leverage the wisdom of crowds, by aggregating dispersed information to gain a better understanding of future and present conditions of strategic importance. Hence, there are many tools for carrying out the same rationale in practice. However, the aggregation of diverse lines of sight is essential: As Page (2007b) argues, diversity in predictive models reduces collective error, and this logic of diversity provides a foundation on which to construct practices to leverage differences to improve corporate performance. This similarly promotes the aggregation of sensed issues from the periphery, as diverse lines of sight should accurately predict issues, performance impact, and probable solutions.

A MODEL FOR USING DISTRIBUTED INTELLIGENCE IN SIM

Synthesizing the main arguments from the preceding review can deduce the contours of the suggested approach. Figure 3 is a conceptual model that explicates the main propositions of the suggested approach. The conceptualized model represents an approach to SIM that centers around peripheral predictions of strategic issues and minor initiating events. Hence, it represents an approach that may stimulate processes of double-loop learning in organizations (Argyris, 1976).

The main claim of the depicted process is as follows: By incorporating collective predictions from key stakeholders who operate around the organizational periphery into the process of strategic issue diagnosis (Ansoff, 1975, 1980; Dutton *et al.*, 1983; Dutton and Duncan, 1987; Rerup, 2009), the proposed model could foster effective SIM under volatile conditions of uncertainty. However, certain conditions must be met in order to obtain effective SIM, such as the preconditions for collective wisdom and the presence of various dimensions entailed in the notion of a receptive central apex.

--- Insert Figure 3 about here ---

Turning the Peripheral Crowd into Issue Finders

Aggregated judgmental forecasts by the peripheral crowd are utilized to find emerging issues that are in need of the attention of central management. As frontline employees (Hallin *et al.*, 2012), lead users (von Hippel, 1988, 1999, 2005) and overshot customers (Christensen *et al.*, 2004) have been characterized as being at the forefront of novel developments, it would be logical to rely on their aggregated judgmental forecasts of internal and external changes, i.e., using distributed intelligence to predict emerging issues of tiny initiating events in operational conditions that may scale up to impact the strategic performance of the firm (Andriani and McKelvey, 2009; Holland, 2002; Stacey, 1995). Given that people often 'do not see what they aren't looking for' (Andriani and McKelvey, 2009), it would be logical to pay attention to the collective forecasts of operational conditions, as this captures diverse lines of sight (Page, 2007). This could inform management of impending events and provide weak signals of emerging strategic issues (Ansoff, 1975, 1980; Rerup, 2009; Stacey, 1995). The conceptualized approach could likewise speed up the emergence of the networked intellectual capabilities of human agents from the periphery of the firm.

The explanatory logic for the ability of key stakeholders from around the organizational periphery to identify emerging issues is twofold: Frontline employees and customers are in a position to be the first to sense emerging issues, as they are the most exposed to changes. As it has been described in the present paper, experiential learning is grounded in short learning loops that can create more updated insights than the long learning loops of the central apex. This provides part of the explanation for utilizing the aggregated sensing from key stakeholders engaged in the firm's daily operations. The other part of the explanation is rooted in the remarkably accurate predictions that crowds can provide (Surowiecki, 2004), if they are comprised by individual predictions living up to certain requirements (Page, 2007a). Here, the essential requirements are ability, diversity and independent predictions, in order to avoid information cascading and herd behavior (Larrick et al., 2012; Page, 2007a; Surowiecki, 2004). Inspired by models of group consciousness (Gloor and Colladon, 2015), these boundary conditions can be depicted in a three-dimensional framework (figure 4). Although it could be

argued that independence and diversity are related, the model depicts them as two different dimensions, as independence is a necessary, but insufficient, source of diversity – and diversity in itself is no guarantee for independent predictions among the respondents.

--- Insert Figure 4 about here ---

Proposition 1.1: *Frontline employees can collectively sense emerging strategic issues.*

Proposition 1.2: *Customers can collectively sense emerging strategic issues.*

Proposition 1.3: *Frontline employees and customers can predict developments accurately only; if they have sufficient ability, their predictions are provided independently of each other, and if they have diversity in their cognitive models.*

Turning Central Management into Issue Resolvers

It is of paramount importance to pay attention to the pivotal role of central management in the model: The conceptualized model entails the notion that central management will need to act on the issues identified by peripheral crowds. Hence, issue identification is restricted to the collective predictions of key stakeholders, whereas central management must engage in interactive discussions (Simons, 1990, 1991, 1994, 1995) with the purpose of gaining deeper and more updated insights for interpreting the issues and potential responses. The interactive discussions around identified issues can provide a basis for interactive learning that may result in various response alternatives. As it has been noted by Dutton and Duncan (1987), the creation of momentum for change through the process of strategic issue diagnosis depends on the effect of the organization's belief structure and its resources on the interpretive assessments in the process. Hence, this explains why firms may respond differently to the same strategic issues, and why an open central management plays a pivotal role by engaging in interactive discussions with actors from around the organization. Without this openness, and ability of self-critical reflection, the potential for double-loop learning will be eroded (Argyris, 1976).

Moreover, the work of Dutton and Duncan (1987) similarly emphasizes the importance of the managerial interpretation of issues and the subsequent prioritization of responses to emerging issues. The model's emphasis on an active role of top management echoes Lovas and

Ghoshal's (2000) incorporation of a more realistic role of top management in shaping the direction and outcomes of evolutionary processes within firms. Hence, "The responsibility for managing the system is assumed by a senior management group which has the resources and the authority to initiate prompt action without unnecessary delays" (Ansoff, 1980, p. 134). This means that management plays a pivotal role in orchestrating the appropriate responses toward rapidly evolving issues (Ansoff, 1980).

Because management would need to adjust how they typically perceive themselves, the transition from issue identifiers to issue responders logically influences their dominant logic. Dominant logic is defined as, "a mind set or a world view or conceptualization of the business and the administrative tools to accomplish goals and make decisions in that business. It is stored as a shared cognitive map (or set of schemas) among the dominant coalition" (Prahalad and Bettis, 1986, p. 491). The sources of dominant logic stem from reinforcement of a world view by market success (operant conditioning), complex problem solving abilities such as cognitive simplifications (paradigms and pattern recognition) and cognitive bias (Prahalad and Bettis, 1986). It is furthermore essential to note that, "Critical signals on the validity of current practices more often than not are experienced as a profound critique of those authorities who have developed and advocated the method of doing business and gaining competitive advantage in question" (Schreyögg and Kliesch-Eberl, 2007, p. 929-930). Hence, top management may feel humbled and threatened by critical surveillance activities, and consequently, "Members of the power structure therefore often launch indirect threats and intimidating messages to keep the stream of critical signals under control" (Schreyögg and Kliesch-Eberl, 2007, p. 930). This is remedied by a self-critical top management, who has an open and inquisitive mindset that allows questioning the status quo. In this manner, criticism and strategic dissonance can be utilized constructively by top management (Burgelman and Grove, 1996, 2007) to foster higher-levels of learning (Argyris, 1976).

Proposition 2.1: *The top management team must have an open, inquisitive and self-critical mindset to allow updating of erroneous initial beliefs in view of dissonant counterfactual signals sensed collectively by the periphery.*

Proposition 2.2: *The organization must have supportive organizational processes to be able to react to collectively sensed issues from the periphery.*

Proposition 3: *The interaction of accurate peripheral predictions and appropriate conditions of central responsiveness will result in effective strategic issue management.*

CONCLUSION

In this paper, the notion of utilizing the collective predictions of key stakeholders who operate around the organizational periphery in SIM has been introduced. The notion provides the contours for an approach to SIM that emphasizes responsiveness to conditions of uncertainty. It has been proposed that key stakeholders operating around the organizational periphery can collectively predict internal and external issues, and that central management could continuously aggregate, diagnose and act upon their insights through interactive discussions and subsequent learning. The paper has introduced a conceptual model for using distributed intelligence in SIM. The model builds on SIM, collective predictions and interactive management control systems within a context of Knightian uncertainty: The model proposes an active role of top management in interactively learning about and resolving the sensed issues. In conjunction, this could constitute an organizational response capability in line with integrative strategy. Consequently, central decision makers can allow themselves to navigate their attentional priorities according to the collective predictions of dispersed actors. However, it is essential that the process of mutual central and peripheral engagement would need to be a continuous interaction, as the early signals of emerging issues evolve on an ongoing basis, and the state of urgency of the issues may change.

Theoretical Contributions and Implications

The conceptualized approach, which has been derived in the present paper, contributes to the literature in SIM in several ways.

As noted at the outset of the paper, using collective wisdom from the organizational periphery in SIM is not yet well-developed (Ansoff, 1980; Dutton and Duncan, 1987; Hallin and Andersen., 2014). Hence, the first contribution consists of introducing a conceptual model that provides a vantage point into the cross-fertilization of the literary streams in crowd wisdom and SIM. Second, the paper contributes by arguing that using aggregated judgmental forecasts in SIM processes may stimulate double-loop learning within the organization (Argyris, 1976). Moreover, it is argued that this interactive learning potentially has superadditive effects, as

peripheral learning combined with central learning may simultaneously foster interactive learning. Thirdly, the study deals with crowd wisdom within a context entailing organizational processes and managerial mindsets. This differs from most studies researching crowd wisdom, as it seeks to balance aspects of collective wisdom and managerial decision making. Finally, the paper contends that the proposed approach reconciles central and peripheral processes, along with intended and emergent processes, as the use of crowd wisdom in SIM utilizes a central and intended process for making use of emergent peripheral insights. This contributes to the reconciliation of the classical debate between the planning and learning approaches to strategy.

Limitations and Research Agenda

While the conceptualized management approach makes several theoretical contributions, it is evident that future research directions would need to explore the verisimilitude of the conceptualized process model in empirical studies entailing both qualitative and quantitative approaches. This not only meets the need to empirically validate the developed frameworks and general argument, it can also provide rigorous investigations of the concepts entailed within the proposed SIM approach. Here, it would be relevant to investigate the validity of the approach in different industry contexts. The notion also needs further conceptual development: Future studies may look into the qualitative differences in the knowledge of the organizational actors placed at the central apex and the organizational periphery. This likewise calls for a focus on the micro-foundations of the processes (as made clear and initially explicated in e.g., Pedersen (2014)).

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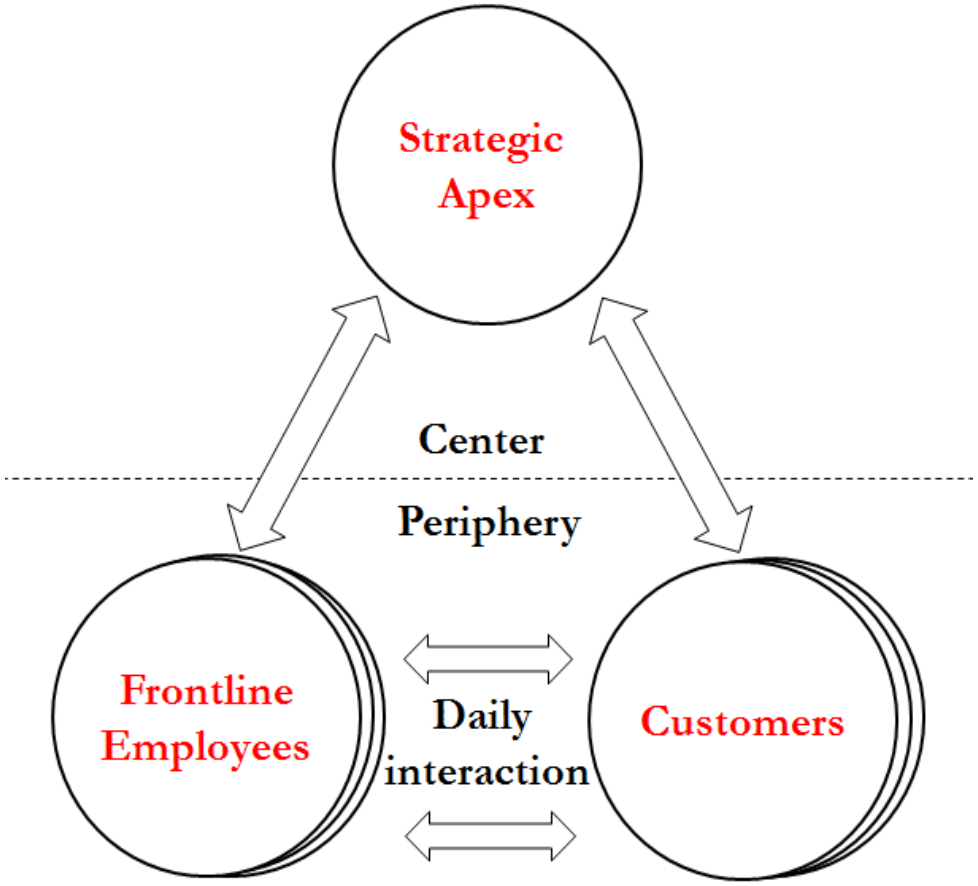

Figure 1: The organizational periphery

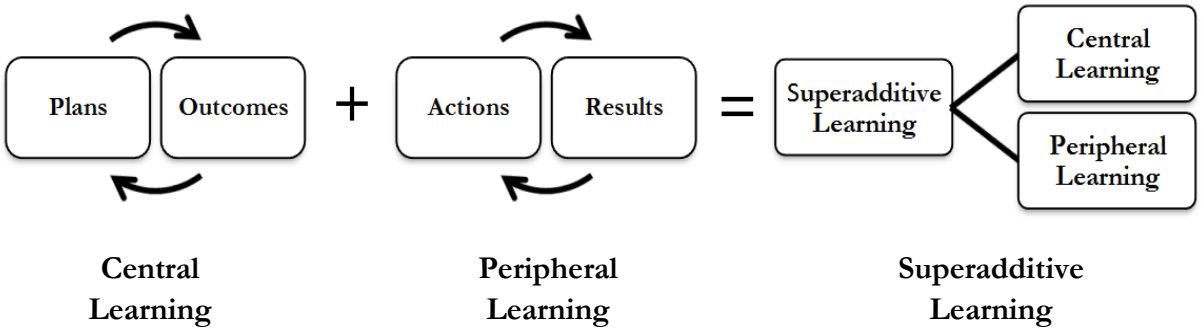

Figure 2: Superadditivity of interactive learning

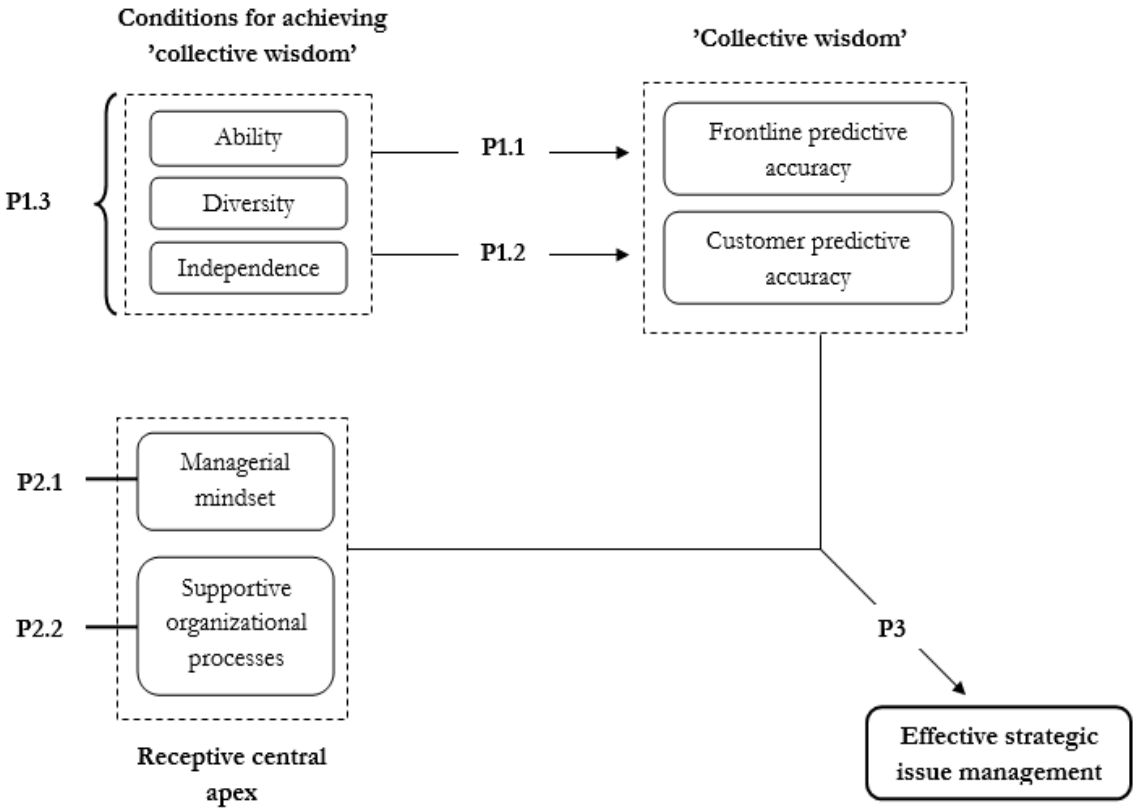

Figure 3: A model for using distributed intelligence in SIM

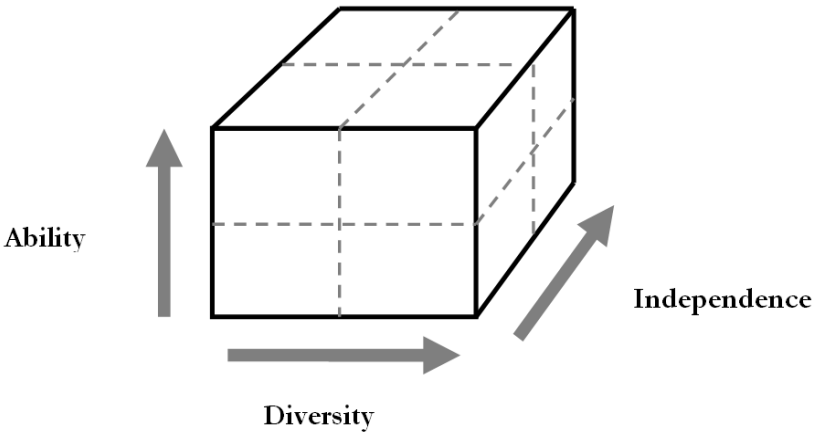

Figure 4: Three-dimensional model of crowd requirements

CHAPTER 3

DEDUCTIVE STRATEGIC EMERGENCE IN A HOSTILE INDUSTRY CONTEXT: BREAKING FORMAL RULES[4]

CARSTEN PEDERSEN
TORBEN JUUL ANDERSEN

Abstract

This study of a market-leader in a turbulent and hostile telecommunications industry uncovers a model of strategic emergence within a deductive strategy-making process. It shows how a highly competitive industry conditions a setting of reduced organizational slack that inhibits inductive autonomous initiatives and urges central deductive actions. The dynamic competitive pressures combined with a strong corporate heritage cause strategic initiatives to primarily emerge as deliberate actions induced by the strategic apex around top management. These centrally driven processes create an information gap between the ongoing experiences gained by frontline employees operating in the periphery of the organization and the perceptions of key decision-makers at the corporate center. This organizational setting fosters managerial maverick behavior with disregard for formal rules to turn autonomous initiatives into viable strategic ventures.

Keywords: Competitive dynamic, Emergent strategy, Intended strategy, Organizational adaptation, Strategic response capabilities, Uncertainty

[4] Earlier versions of this paper have been presented at Strategic Management Society Conferences in Sydney and St Gallen.

INTRODUCTION

It is generally recognized that strategy-making is comprised by a mix of intended strategies from deliberate actions induced by top management at the corporate center and emergent strategies deriving from autonomous initiatives taken by managers dispersed throughout the organization (e.g., Bower, 1970; Burgelman and Grove, 1996; Mintzberg, 1978; Mintzberg and Waters, 1985). The underlying complex organizational decision processes are typically identified and analyzed in qualitative studies (e.g., Bower and Gilbert, 2005; Burgelman, 1983; Bourgeois and Eisenhardt, 1988; Eisenhardt, 1989a; Regnér 2003) and extended in case-based studies of concrete strategy-making practices (e.g., Johnson, 1988; Melin, 1985; Whittington, 2007). Such studies are fertile grounds for examining the micro-foundations of strategy dynamics and forming a deeper understanding of effective strategic responses in different competitive and organizational contexts (Andersen and Bettis, 2015; Regnér, 2008).

There is an implicit assumption in the antecedent strategy process literature that the organization somehow is able to balance centrally induced and dispersed autonomous initiatives as precursors to realize intended and emergent strategic outcomes and practiced strategy-making. However, our knowledge about how these dynamic processes interact effectively over time remains limited. A recent study made interesting inroads to analyze the intricate dynamic between autonomous initiatives and emergent strategy formation (Mirabeau and Maguire, 2014). In a longitudinal study of a multinational telecommunications firm, Mirabeau and Maguire (2014) identified 17 induced and 7 autonomous projects defined as "dissonant" strategic initiatives[5] and analyzed how they evolved into emergent strategy. This demonstrates that autonomous initiatives can have a significant impact on emergent strategy outcomes consistent with other studies on the induced and autonomous strategy dynamic (e.g., Burgelman, 1991, Mintzberg and Waters, 1985). This creates relevant insights about how strategy can take form and emerge through the impact of autonomous projects arising from organizational agents with dissonant views on the formal and intended strategy. Here we extend this perspective by explicitly considering the interplay between the centrally induced initiatives and the autonomous projects (e.g., Burgelman and Grove, 2007) while capturing specific insights from a national player in a competitive industry context. Hence, we analyze strategy formation in a leading European telecommunications company operating in a highly dynamic and hostile industry with the aim of

[5] Autonomous projects were determined by whether they were considered to be dissonant with the prevailing strategy concept at the time of their initiation whereas induced projects were consonant with the prevailing strategy.

gaining a more nuanced understanding of how intended and emergent strategies are realized in this context. In doing so, we honor the call for "contextualised explanation" in qualitative studies as a way to develop new relevant theoretical insights when "contingent conditions … in combination with a causal mechanism, produce an outcome" (Welch, Piekkari, Plakoyiannaki and Paavilainen-Mäntymäki, 2011: 741).

In this research we adopt a qualitative descriptive approach to uncover how the company conducted its strategy-making processes to better understand how they operate in their industrial environment. We use the extant strategy process literature as foundational inspiration in the qualitative inquiry about strategy formation where we see strategy as formed by a stream of resource committing decisions taken by managers at different hierarchical levels and functional areas of the organization over time (Bower and Gilbert, 2005, 2007; Burgelman and Grove, 1996, 2007; Mintzberg, 1978, 1990). The analysis uncovers how strategy is realized from emergent initiatives linked to a formal intended strategy-making process and thereby creates new insights about the contextual framing of the interplay between strategic intent and emergence (Mintzberg and Waters, 1985). We relate this to the concepts of induced and autonomous strategic initiatives (Burgelman and Grove, 1996, 2007), deductive and inductive strategy-making (Nonaka, 1988; Regner, 2003), and dynamic interaction between central strategic planning and decentralized responses (Andersen, 2004, 2013). We gather information from a longitudinal qualitative study of the strategy formation process in a large national telecommunications company over the past decade. One of the researchers was employed with the company in a dedicated research position during the full period of the study thereby gaining intimate knowledge about organizational practices with access to informants among executives, managers, and frontline employees for personal interviews and primary data collection.

This empirical qualitative study adds new understanding to the complex strategy-making process comprised by intended and emergent strategy-making elements as they happen(ed) in a particular competitive industry context and organizational setting. The study contributes to the strategy field in several ways. First, the study adds nuance to current strategy process studies by considering the strategy formation of a market-leading company operating in a highly competitive European industry. Second, the study uncovers the interaction between intended and emergent processes realizing that both are significant where the interplay between the two may give important clues to effective strategy-making practices. Thirdly, the study considers two

alternative views on emergent strategic adaptation including one instigated by top management (Quinn, 1979, 1980) and one deriving from spontaneous actions taken by dispersed managers (Mintzberg, 1978, 1994). Fourthly, we contend that challenging organizational settings may foster maverick behavior among certain employees. Finally, the study accepts that organizational processes including complex strategy-making are influenced by corporate memory, embedded practices, and the competitive conditions of the industry. In other words, we show that context matters and that complex interactions between strategic intent and improvised responses play a vital role in the way strategy is realized by organizations operating in turbulent environments.

STRATEGY FORMATION

Mintzberg (1979) identified two rather distinct and seemingly opposing ways in which strategy can take form in organizations. The first was referred to as the *planning* mode where strategy is developed in an orderly, integrated and purposeful manner as a conscious choice, or intent. The other was referred to as the *adaptive* mode where strategy emerges, or comes about as things happen and managers meddle through and bargain about ways to act under the given conditions. This nuance in perspectives carried the insight that realized strategies must derive from both intended and emergent strategies (Mintzberg, 1978; Mintzberg and Waters, 1985) and that strategy will appear in ex post analysis as patterns in decisions, or actions taken over time.

The planning mode reflects the conventional strategic management view of a formal analytical process to determine a proper strategy that subsequently is implemented by the organization (e.g., Ansoff, 1988; Mintzberg, 1990). The adaptive mode reflects an informal social learning process where organizational actions are adapted on an ongoing basis in response to changing conditions in the surrounding environment (e.g., Burgelman, 1988; Mintzberg, 1990). Hence, strategy formation seems to "walk on two feet … one deliberate, the other emergent" where "managing requires a light deft touch to direct in order to realize intensions while at the same time responding to an unfolding pattern of action" (Mintzberg and Waters, 1985: 271). A better understanding of how the two feet walk together and how the two strategy-making modes interact may help explain how the complex strategy formation process unfolds. There is a general understanding that responsive entrepreneurial behaviors are essential to deal with changing conditions and renew the strategy (e.g., Aggerwal and Helfat, 2009; Covin and Miles, 1999; Wolcott and Lippitz, 2007) while rationality and structure are important to attain

economic efficiency (e.g., Baum and Wally, 2003; Brews and Hunt, 1999; Goll and Rasheed, 1997)[6]. That is, the ability to engage in effective adaptive strategies relies on entrepreneurial responses as well as integrative structures that coordinate the execution of strategic activities (Andersen and Nielsen, 2009). This leads to a conceptualization of strategy formation as iterated decisions that allocate resources towards concrete actions over time by decision-makers in different parts of the organization (e.g., Bower, 1986; Bower and Gilbert, 2005; Burgelman, 1983; Mintzberg, 1994; Noda and Bower, 1996).

Intended and emergent strategy

The formation of intended strategy is typically described as a longitudinal sequential process of analytics-based planning with subsequent execution and monitoring of outcomes in a strategic control process (e.g., Ansoff, 1988; Anthony, 1965; Richards, 1986; Schendel and Hofer, 1979). This strategic management process creates strategic purpose and direction with related long- and medium-term goals and a suggested way to accomplish the intended outcomes. The adaptive learning approach is an evolutionary process where top management sets a general vision while strategic initiatives are dispersed to lower-level managers in the organization as they respond to opportunistic environmental developments (Bower and Gilbert, 2005; Bower and Doz, 1979; Burgelman, 1983, 1996). If the dispersed initiatives are successful, they can eventually be incorporated as part of the formal corporate strategy. This is also expressed as 'guided evolution' (Lovas and Ghoshal, 2000) where decentralized initiatives in principle are pursued in accordance with the strategic vision of top management.

However, the autonomous opportunistic initiatives taken by lower-level managers must typically be championed by middle managers to gain the attention of top management and consider the viability of the new business activities within the existing corporate strategy (Burgelman, 1983, 1996). In other words, there is an adjacent social negotiation process interpreting and categorizing strategic issues in view of environmental conditions (Dutton and Duncan, 1987; Dutton and Jackson, 1987; Dutton and Ottensmeyer, 1987). Strategic issues can be dealt with through reflective/active and unreflective/automatic managerial decision-making processes where prevailing organizational features arguably make the latter approach the more dominant form (Dutton, 1993). Hence, the underlying process of selling strategic issues explains how organizational actors frame the issues and use different moves to get attention and support for

[6] For the sake of terminological clarity we note that Regnér (2005) ascribes the latter approach to an *adaptive* logic and the former to a *creative* logic.

desired actions (Dutton, Ashford, O'Neill and Lawrence, 2001). Dutton et al. (2001) identify three distinct 'selling' practices: (1) link issues to goals, (2) involve social contacts, and (3) move to affect managerial attention and influence decisions.

Fundamental changes in the competitive context come about every so often and constitute times where executives must make strategic decisions to adapt the current business (Mintzberg, 1987). So, as executives 'craft' the strategy they must develop a sense for when and how the organization should respond to the changing conditions. That is, emergent strategic initiatives can also be instigated by top management as implied by Quinn's (1979, 1980) concept of "logical incrementalism". Empirical studies of strategy formation in real organizations seem to reveal that major strategic changes often happen in periodic bursts displaying long-term strategy trajectories of "punctuated equilibria" (Mintzberg and Waters, 1982; Mintzberg and McHugh, 1985). This phenomenon is also apparent in the case of Intel's change process to become a micro-chip producer in the early 1980s as the evolving competitive reality presented the company with a "strategic inflection point" of fundamental structural change in the industry where it had to renew its strategy (Burgelman and Grove, 1996; Grove, 1996). Longitudinal empirical studies of the same company show a stronger imposition of induced strategies from top management in periods after the strategic focus changed to create alignment and economic efficiencies (Burgelman and Grove, 2007).

The four approaches to strategy formation identified from the literature are illustrated in Figure 1. Two elements are the top-down driven process of strategic planning and monitoring and strategic adaptation imposed periodically by the incremental logic of top management. Other two elements are the bottom-up driven autonomous entrepreneurial initiatives among lower-level managers and the 'selling' of emergent 'strategic issues' championed by middle-managers as opportunistic solutions. This framework provides some nuance to the basic intended and emergent strategy processes identified by Mintzberg (1978) where strategy-making seemingly "walks on two feet" (Mintzberg and Waters, 1985) thus implying different top-down and bottom-up processes that interact along the way. Although the various theoretical concepts have distinct underlying assumptions, it is argued that this diversity in perspectives is representative of strategy-making at multiple levels in real-life organizations.

---- Insert Figure 1 here ----

Interactive strategy-making

The planning of strategic intent and the emergence of autonomous initiatives are often considered as distinct sub-processes where strategic intent influenced by top management vision "is exogenous to the evolutionary and ecological process" (Lovas and Ghoshal, 2000: p. 886). So the evolutionary emergent models where initiatives derive from the actions of low-level managers (Mintzberg, 1994; Burgelman, 1996) do not really consider a dynamic between central planning for intent and dispersed strategic initiatives. While Regnér (2003) identifies fundamentally different strategy activities at the center and the periphery of organizations the interaction between the two remains fairly unexplored. Hence, the possibility for interactive processes between strategic intent at the center and responsive initiatives in the periphery are not considered, which is a potential shortcoming of the evolutionary strategy view (Lovas and Ghoshal, 2000). Top management is rather passive in evolutionary theory and not actively involved in the execution of strategic actions.

The dynamic capabilities perspective reflects high-level routines that provide the organization with an ability to adapt its strategy to ongoing changes in the environmental context (e.g., Helfat et al., 2009). The strategy-as-practice perspective sees this process as the result of concrete organizational activities where the view is, that "strategy is something that *people do*" (Johnson et al., 2007). In other words, strategy derives from social practices around day-to-day activities performed by individuals located in different parts of the organization that can be observed and analyzed. Hence, the way organizational members interact as they shape a strategy is an essential part of the strategy-as-practice approach that can extend the analytical perspective to consider the influences of broader social, cultural, and cognitive contexts (Jarzabkowski, 2005; Regnér, 2008).

The cyclical planning process with analytical formulation, execution, monitoring, and updating through strategic controls implies a strategic learning loop where top management reconsiders the intended strategy in view of realized outcomes. Mintzberg's (1994) depiction of strategic emergence promotes dispersed initiatives that develop new opportunities often without the awareness of top management. The initiatives taken by low-level managers create experiential insights about evolving market conditions that normally would be invisible to top management. These insights can be seen as a source of updated strategic information that can be collected and considered in strategic action plans. So, the environmental insights of dispersed managers can

update the knowledge of top management and challenge their preconceived perceptions (Mintzberg, 2009). Hence, the strategic thinking at the core of the central planning process can be informed by insights gained from decentralized initiatives (e.g., Andersen, 2004; Andersen and Nielsen, 2009). The implied interaction between autonomous strategic initiatives and a strategic planning process can support decisions and update strategic action plans. While there is a need for autonomous initiatives to find alternative strategic options, there seems to be an equal need for induced strategy that can guide initiatives in a dynamic environment and coordinate organizational activities (Burgelman and Grove, 1996, 2007).

METHODS

To gain further insight on the circumstances around the interacting strategy-making processes we engaged in a longitudinal qualitative study on a market-leading incumbent operating in a highly competitive and dynamic industry.

Single-case study and research site

We conducted an exploratory single-case study of the strategy-making processes at a telecommunications provider in Europe[7]. The study was conducted from 2013 to 2015. The choice of research site predominantly rested on three main considerations. First, the dynamic unpredictable nature of the telecommunications industry made it a fertile ground to understand emergence and evolving strategy processes. Second, the size of the company made it interesting in view of the interplay between central planning and peripheral learning. It was possible to observe intricate relationships between, e.g., induced and autonomous initiatives, issue selling, and resource allocation decisions. Third, the company was characterized by a unique heritage and operated in an extremely competitive national market, which may provide an alternative perspective to Mirabeau and Maguire's (2014) study of how autonomous strategic behavior turned into emergent strategy in a Canadian telecommunications company. As the case comprised a unique setting with idiosyncratic characteristics that could still be related to the findings of e.g. Mirabeau and Maguire (2014), a single case was deemed appropriate for the purpose of the present study (Dyer and Wilkins, 1991; Flyvbjerg, 2006; Siggelkow, 2007; Yin, 2003).

The purpose of the study was to uncover strategy-making as it happens across different hierarchical levels in a single organization with multiple business units in a high-velocity

[7] The company will remain anonymous in the paper.

national industry. A case study is typically defined as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2003, p. 13). According to Yin (1981), a case study can be likened to an experiment where evidence is collected around topics, propositions and research questions. Unlike an experiment, the empirical inquiry investigates a phenomenon within its real-life context without manipulation of specific variables and case studies are ideally suited to observe contemporary events where behaviors cannot be manipulated. Therefore, the case study methodology is useful for our purposes, as it can provide rich contextual descriptions of phenomena as the basis for inductive theory development recognizing relationship patterns between constructs and their logics based on a grounding in related literatures and research questions to guide the theory building (Eisenhardt, 1989b; Eisenhardt, 1991; Eisenhardt and Graebner, 2007). The researchers were insignificant onlookers and participant observers in the organizational context attempting to explain the *how* and the *why* of the complex interacting strategy-making processes.

Even though the study was exploratory in nature, a case study approach requires the construction of a preliminary theoretical framework to guide the data collection as well as to specify the unit of analysis. Hence, the present study constructed a broad theoretical framework to guide our initial understanding and search for insights where subsequent empirical observations could be compared to the literature for analytical generalizations (Yin, 1981). The design reflects Yin's (1981) notion of embedded single-case design, as multiple units of analysis embedded within the same context was utilized incorporating various business units, levels, and functions in the study. Here empirical observations were compared to theoretical rationales for a comprehensive explanation that could revise and update existing literary streams, consistent with some of the main arguments for using single cases (Flyvbjerg, 2006; Siggelkow, 2007).

At the time the study was conducted, the case company was the leading provider of communications solutions and Pay-TV in the local market, where the company had market leadership across all segments. In adjacent geographies, the company was the main challenger. The corporate history of the company can be traced to 1881. The later history has been characterized by market deregulation, divestment of peripheral international businesses, transition from state-owned to being owned by private equity funds and then becoming a publicly quoted company.

Inquiry from the inside and from the outside

We sought to combine both an inside and outside perspective to the study. Inquiry from the inside is characterized by the immersion of the researcher in the corporate setting to gain experiential insights and situational knowledge (Evered and Louis, 1981). In contrast, a detached researcher inquire from the outside and validate the generalizability of nomothetic knowledge based on concrete measures and underlying logic. Evered and Louis (1981) posit that the two modes together form a more appropriate inquiry by enhancing reflective choices among researchers in the face of intricate and ambiguous organizational settings. Hence, we combined the two modes of inquiry with one of the authors immersed within the organization for a three-year period and the other author detached from the research setting. This allowed the authors to combine insights and triangulate the diverse perspectives of the participant observer and the detached onlooker. As suggested by Evered and Louis (1981), we moved back and forth between these modes to validate new insights discussing differences in interpretation to obtain a holistic understanding.

Data collection and analysis

The data was comprised by an amalgam of internal (e.g., semi-structured interviews, presentations, formal announcements and observations) and external information (e.g., reports, articles, and archival data). The information consisted of both primary and secondary data reflecting both quantitative and qualitative aspects, i.e., mixed methods (Axinn and Pearce, 2006) (Table 1). The volume of the data was exemplified by the fact that a compilation of predominantly secondary data comprised well over 700 physical pages with print on both sides of the papers – or what would be equivalent to over 1400 single print pages.

---- Insert Table 1 here ----

The data collection and analysis phases entailed various steps. First, we drew on external and internal data at the organizational level to understand (i) the corporate history (ii) the evolution of strategies in the company, and (iii) formal strategy processes and their relationships to budgeting and resource allocation decisions. In the second step we drew on data at the industry level to understand the competitive situation in the local telecommunications industry. The insights from these steps were combined and discussed to assess the path dependent contextual reality of the company's strategy development. Based on these findings, it was decided to focus on strategy-making at various hierarchical levels in the period between 2013

and 2015 where the company was dealing with the demands of an increasingly competitive market. These initial considerations provided the necessary foundation to move the study to the next and third step.

Semi-structured interviews

In the third step, we collected qualitative data about the strategy processes both among division managers and key employees from various semi-structured interviews with relevant people in the organization. Prior to the data collection, a preliminary theoretical framework was developed based on the literature. The framework provided an integrative perspective on strategy-making in organizations, and served as the basis for the interview grid focusing the interviews on relevant theoretical themes and constructs that could be compared across the respondents to secure validity and reliability. The interview grid was based on theoretical themes such as intended vs. emergent strategy (Mintzberg and Waters, 1985), strategic planning (Mintzberg, 1994), induced and autonomous initiatives (Burgelman and Grove, 1996, 2007), resource allocation processes (Bower and Gilbert, 2007), strategic issue management (Ansoff, 1980), issue selling (Dutton and Ashford, 1993), and interactive management control systems (Simons, 1990, 1991, 1994). The broad incorporation of theoretical themes resonated with the explorative purpose of (i) understanding the strategy processes, and (ii) utilizing specific findings surfaced during the data collection to compare to the relevant theory (Yin, 1981). Albeit theoretical guidance for the interviews was necessary to determine the unit of analysis (as the paper sees strategy as 'strings of resource-committing decisions'), the interviewer was aware of counterfactual interviewee responses allowing new perspectives that were elusive in the initial frameworks. Hence, a theoretically guided explorative approach was pursued with the interviewer cognizant of possibly having research agendas that 'capture the loose set of concerns and orientations that are central to the researcher who is conducting social research" (Potter and Hepburn, 2012, p. 562).

The study conducted and analyzed 13 semi-structured interviews. As the study followed an embedded single-case design, we pursued interviews with people (i) from different functions and business units (ii) at different levels of the organizational hierarchy, and (iii) who had different experiences, responsibilities, roles, stakes, and interests in the strategy processes (Table 2). Here, we sought to benefit from the various stakes and interests that are typically present when conducting qualitative studies.

As the organizational setting influences the interview process and findings, various aspects needed to be considered in the sampling of interviewees. A list of initial respondents was compiled. However, to pursue a rationale of incorporating emergence into the intended and planned research processes, subsequent interviewees were identified through snowballing. The interviewees received the interview grid prior to the interview so they could peruse the questions. By sending the interview grid in advance, the respondents could form their answers, recollections and assessments prior to meeting the interviewer to minimize inter-subjective biases. Most of the interviews were recorded, and interview summaries were subsequently sent to the interviewees to ensure that the interviewer had understood the respondents correctly. Two of the interviews did not follow this approach, as it was not possible to record them under the circumstances in which they took place. These interviews were only used to validate insights from other respondents. Each of the interviews conducted between September 2014 and May 2015 lasted approximately one hour. The background and purpose of the study was explained to the interviewees prior to the meetings. Interview summaries were written within 48 hours after the interviews were concluded.

---- Insert Table 2 here ----

Analysis of the interviews

The textual interview data was manually coded on the basis of categories derived from extant literature. A few important reoccurring concepts that initially seemed firm-specific were also coded inductively from the data, and subsequently discussed in view of the relevant theories. This allowed a certain degree of empirical emergence into the coding scheme, which resonates with the explorative aim of the project. Research is an emergent process where one cannot know from the outset what will be found or issues that arise, and one must adopt the insights from chance events encountered along the way (Wilkinson and Young (2004). The coding scheme was predominantly a priori deductive themes, yet allowing a posteriori inductive themes to emerge to foster a dynamic abductive process.

The final phase detected patterns across the interviews, and interviewee responses were compared to detect subtle differences and similarities. Once patterns were detected, they were compared to findings from the relevant literary streams. Here, the approach captures a process characterized by Wilkinson and Young (2004) as “collection and assembly of pieces of a knowledge jigsaw puzzle; one in which you do not know the shape or nature of the final

picture." The challenge is to create a meaningful synthesis of disparate findings gathered from various interviews.

ANALYSIS

Findings

In this section we first focus on the formal processes of intended strategies that characterize the forward-looking analytical activities of strategic planning and execution. This is followed by descriptions of emerging initiatives that either derive from the center or the periphery of the organization. Then the section probes the ongoing interaction between the center and the periphery and briefly touches upon the contingent roles of environmental context and organizational heritage. The indications of intended strategy, emergence and interactive process themes between center and periphery stem from both initial theoretical and emergent codes (Table 3). Each interview provides a piece of the intricate strategy-making and resource allocation processes that play out within the case company.

--- Insert Table 3 her ---

Intended strategy and formal process

Intended strategy and formal processes describe the predominantly analytical and formal activities that go into formulating, executing and tracking a strategy. It entails various planning processes that feed into budgeting and resource allocation decisions. These processes tend to be guided from the central apex of the organization.

Guiding star, strategic boundaries and formal processes

One key notion in the interviews was the importance of having a formal strategy in place that guided the forward-looking aspirations of the organization, and provided the contours for organizational actions. Furthermore, the benefits of having formal processes in place to formulate and execute the strategy were also evident in several interviewee responses. Thus, our findings echo this classic rationale from the more normative strategy literature, as the interviewees generally described a similar role of the long-term strategy, and as many expressed an explicit need for this type of deductive or induced long-term guidance. For instance, the role of central forward-looking aspirations was often described as necessary for daily sense-making.

> "I think that in a large company you need a formal process, as you cannot be in a perpetual strategy mode. You should obviously be ready to react if events suddenly emerge. You should also be prepared to

> change direction or adjust your strategy - but it is important that the strategy always has an overarching guiding star: So when you change direction, it is still the same guiding star. The roads to the guiding star may change, but it is sensible to have a formal process annually, where you look up and figure out what the focus should be the next year" (Interviewee 1).

Here the interviewee is particularly aware of the aspirational role of a conceptual guiding star for the organization as well as the importance of top management having laid out so-called corner flags or strategic boundaries. These strategic boundaries explicate the boundary conditions of organizational activities, and hence, the limits for where they will focus resources. Being questioned about the influence of predetermined aspirations on the ability to respond to dynamic changes in the environment, the interviewee did not necessarily see a chasm between the two.

> "If your guiding star is correct and broad enough, then I also believe that there is room to maneuver" (Interviewee 1).

In the case company, the long-term formal strategy and the strategic boundaries were conceived at the top, with subsequent involvement of the local business lines in order to operationalize the broad vision and strategic conjecture laid out by the top management team. The processes were highly formalized and explicitly stated the needed actions.

> "The strategy starts out top-down with top management discussions of which trajectory should be pursued. Subsequently, these broad strategic contours hit the business lines. This is a place where top-down and bottom-up processes meet, as the business lines formulate their must-win-battles and state how they are in line with the strategic trajectory" (Interviewee 12).

Hence, the formal process was conceived at the center with subsequent peripheral involvement and input. The formal processes and the content thus guided subsequent actions and created a common strategic platform although sometimes at the expense of being agile and responsive.

> "The strategic processes follow an annual cycle with specific activities in specific months […] The advantage of a formalized strategy process is

> that it provides a common platform that enables people to work together and reach objectives within a specified date. The disadvantage is that you are locked into a certain structure, so if something unexpected happens, you will not necessarily be able to respond and adapt" (Interviewee 11).

Albeit several interviewees generally appreciated central aspirations, few interviewees similarly acknowledged the negative consequences of the highly formalized processes and sporadic involvement of middle managers. This highlights the notion that peripheral involvement may not automatically provide the needed input, as it depends on the manner and setting in which it is done.

> "The process is a double-edged sword: Many people in the organization are involved sporadically in the process, and therefore, they do not know exactly what to contribute with, because they do not know exactly how it will be utilized. The stream of feedback about the use and context of the input is weak […] People often take part in a workshop and afterwards ask themselves: What exactly just happened? Two or three months later they can see the result on a portal and say to themselves 'oh, so that is what happened"' (Interviewee 5).

Furthermore, the challenge of maintaining firm responsiveness despite having very formal processes was also mentioned among several interviewees: "We are kind of locked in to the current processes that we have" (Interviewee 7). Furthermore, the strategy was not always seen as leading the way.

> "One of the primary challenges is that the long-term strategy is interpreted in many different ways locally in the organization […] In my view, the general strategy is too top-down. Often you just get the strategy presented to you. There are few people involved in formulating the strategy - and those people are from the top. I have not been involved in formulating the formal strategy at the group level in any way" (Interviewee 10).

Equity story and shareholder value

One of the themes that emerged inductively from the data centered on the importance of the so-called 'equity story'. The notion of equity story explicated the pivotal role of generating shareholder value for dividend payment as the general strategy content. It was apparent in several interviews that the equity story influenced the strategy and the related processes to formulate it defining a basic view for the strategic and operational ambitions and targets.

> "Our equity story explicates how much of our free cash flow we will pay out to our owners […] Our equity story controls the strategy" (Interviewee 12).

Hence, the concept of the equity story can be seen as a promise or selling proposition to the shareholders, and therefore, it controls the subsequent content and execution of the strategy. It could arguably provide an insight into why formal strategies, and remaining 'on track' in terms of the plan, is so important for many of the actors in the case company. This aspect is also referred to as an 'agreement' between the management team and the owners of the firm.

> "If strategies are an agreement between the various managerial levels, the equity story is an agreement between the firm's management team and the firm's owners - with the board being the mediating layer" (Interviewee 2).

Several interviewees explicated how the equity story and shareholder value constituted the core of the strategy work, as it determined the limits of the strategy content and influencing daily operations. The company had undergone important changes in its ownership structure from a government owned enterprise to ownership by private equity funds where the financial expectations of the owners influenced the actions of corporate decision-makers. Consequently, the heritage of the firm played a major role in the way the strategic trajectory was formed and also influenced internal processes as the equity story had an apparent effect on the resource allocation process.

Central resource allocation

A lack of organizational slack (available excess resources) and the presence of a centralized resource allocation were mentioned in most of the interviews. The capex process, i.e., the process to allocate resources for capital expenditures, sought to define the best possible use of resources to achieve the pre-defined strategic and operational ambitions and targets. Several of

the interviewees similarly noted that the central process predominantly was a consequence of the competitive industry context, the equity story and the heritage of the company.

> "Often decisions are not made by what makes sense in the market, but by the resources that are available […] Resources are a substantial internal issue […] I spend too much time fighting for resources internally compared to thinking about what is the right thing to do in the market […] We can talk strategy for 4 hours - and then we can subsequently use the following months to fight for the necessary resources to execute the strategy" (Interviewee 10).

Hence, the interviewee could describe vividly how a minimum of slack and the presence of central resource allocation processes influenced the daily execution of local strategies. This rationale was similarly echoed by various other interviewees.

> "Due to the way that capex is being allocated, you are basically not being allocated enough in the business units. This means that they will need to be very tough in prioritizing between essential projects in the business lines. When you are in that situation, you will not be prone to put resources aside to fuel the development of new business opportunities, and therefore, they are typically not that good at finding growth initiatives adjacent to the core" (Interviewee 11).

The issues of resource allocation and lack of slack were acknowledged at various levels in the organization: The issues were validated both centrally and at the periphery of the organization. Hence, it is something the interviewees generally were aware of and acknowledged.

> "Finding resources is a general challenge in this company: Capex prioritization is an obstacle" (Interviewee 4).

The reasoning behind the resource allocation processes is partly influenced by the necessity to deliver on the so-called equity story. Yet, several interviewees note that this would benefit short-term deliverables, but could likewise hinder more sustainable long-term growth. It similarly means that the periphery could be cut-off from testing new responsive initiatives, and hence, the company typically relied on top-down driven initiatives.

> "It can be difficult to obtain the needed resources to make various probes or tests to develop the organization, as we are so determined to deliver on our equity story […] The challenge with an organization like ours is that many of our initiatives require substantial capex investments. So initiatives originating from within the organization often need to reach a certain level to obtain the needed funding" (Interviewee 12).

Emergent strategy and autonomous initiatives

Strategic emergence is the antithesis to intended strategy, and it can originate both at the center and at the periphery of the organization. Even though emergence typically has been explained in the strategy literature as a phenomenon that emanates from the periphery of the organization other studies establish emergence, or adaptive strategy, as a process driven by the central apex. The case company frequently experienced emergence from the top and only rarely envisaged emergence from the bottom, or the periphery, of the organization in the form of autonomous initiatives. This could be a consequence of central resource allocation and formal strategic planning processes imposed by the commitment to deliver on the equity story, due to ownership, heritage and competitive context.

Emergence from the center

Instances of emergence can be traced in various secondary data of the company, i.e., annual reports, press releases, articles and internal documents exemplifying instances of responses to emerging events and strategic issues. These instances were echoed by many of the interviewees, but the data pointed to the fact that many of these emergent actions were imposed by the central apex due to the need for substantial investments and strategic importance. Yet, when emergent actions were determined from the central apex they were often carefully legitimized by stressing a conceptual linkage to the pre-existing intended strategy.

> "Strategy is never fully carved out in stone, as new things come about which you need to act on and adjust the strategy accordingly. But what I think is important in relation to the 2015 strategy is that 'integrated solutions' has always been the guiding star. Along the way, you may adjust and revise plans because things just happen - but you have always had a guiding star" (Interviewee 1).

However, in other cases it is debatable whether an emergent action was in fact congruent with pre-defined intentions formulated by top management. One example of top management acting on an emerging opportunity that was not initially planned was the acquisition of a major company in an adjacent market which to some extent could be perceived as a change of the prevailing equity story. The acquisition was made because there was a window of opportunity in which the top management team could decide to act.

> "[The acquired company] is an example of us acquiring something which is within our predefined strategy, because we are in [an adjacent geography], we have a [similar] footprint, [similar] customers etc., but it is actually a substantial change in the equity story because it is so expensive for us to do" (Interviewee 2).

In the instances where emerging issues came to the attention of 'people' in the firm, it was often necessary that a member of the top management team became involved to by-pass formal processes and procedures and secure a timely response: "You often need the involvement of a member of the top management team to be able react to emerging issues" (Interviewee 12). It is also noted that the concept of emergence does exist within the company, so it is not uncommon that new initiatives require formal revisions of the intended plans.

> "Emergence does actually happen, as we might find out that something needs to be done to deal with a specific issue. In those cases, we must revise the existing plans" (Interviewee 11).

Autonomous initiatives and slack

Autonomous initiatives are often described in the literature as emerging from the periphery of the organization. Albeit local autonomy was prevalent in many of the interviews, many of the interviewees emphasized the fact that the resource allocation processes were centralized and formal. Hence, the periphery often felt challenged by the formal requirements in creating autonomous initiatives as well as there was insufficient slack in terms of money, time and people available locally to develop them.

> "There is an inherent scarcity in the organization in relation to making things happen: Initiatives could take-off faster, if we were not experiencing the current level of strict economic constraints" (Interviewee 5).

The environmental context does not reveal circumstances of strategy evolving as an iterated process of lower-level resource committing decisions but is rather reflected as a centralized resource allocation process. This was explicitly stated by several interviewees.

> "As the resource allocation is controlled, autonomous projects are limited" (Interviewee 10).

Several of the interviewees argued that this could have a limiting influence on the innovative potential of the company, and made the case for how local resource allocation for innovative probes could ideally become a success in the firm.

> "By making small launches you test if the incremental changes create the expected value for the users and get an idea of what the demand for the product is at the same time […] You can create a pool of money for areas, which you then 'free' from the more formalized resource allocation and project management processes" (Interviewee 7).

Hence, there was an awareness of the argument that a shortage of organizational slack could create a challenge for innovative and responsive initiatives inside the organization. Although this awareness was more pronounced at lower-levels in the organization, the general logic was also noted among certain key decision makers in the central apex.

The effect of formal processes on emergence

It was apparent in the interviews that the formal processes for strategy, project management, budgeting, resource allocation and new product development played an important role for the firm's ability to respond and adapt to changes in the environment. Particularly among middle managers there was an explicit concern around this issue. The formal processes were at times seen as surrealistic.

> "It can be a sort of surreal show where there are many formal demands and requirements, and then everyone who knows something about how things are run also know that you cannot live up to them, if you actually want to put something in the market" (Interviewee 3).

Despite the predominant perception that formal processes were a hindrance for bottom-up emergent responses, few interviewees saw formal processes as an arena that could advance emergence to the formal analyses and forward-looking intended plans.

> "We have a formalized process that we initiate; then we reach some findings - and those findings might pull the process in a different direction: For instance, we might observe that something radical needs to be done within an area - and then the process will be shaped around that finding, because that area then becomes a base assumption for the entire process" (Interviewee 11).

This way of using formal analytical processes to foster emergence has rarely been dealt with in the strategy literature. However, most of the interviewees stressed that formal processes were a hindrance to bottom up responses in a dynamic and evolving environment where emergent events often cannot be predicted. These issues are further highlighted by the particular environmental context of the local telecommunications market, which is considered extremely dynamic and hostile.

> "In [our] market, you do not know what you will be doing 8 months ahead of time. It is so extremely dynamic, so many parameters change and the prices can decrease 50% - we just do not know. So you cannot run the daily operations in an overly formalistic manner" (Interviewee 3).

The nature of the local market and the evolutionary dynamic of telecommunications worldwide were echoed by other interviewees.

> "The competitive situation in [our market] has been unsustainable for some time: Four mobile networks to five million people - they do not even have that many networks in Germany with 80 million people […] The telecommunications industry is in the midst of disruptive change" (Interviewee 12).

It is broadly acknowledged that the competitive environment is at the crossroads of disruptive change exposed to changing consumption patterns and converging industries managed by intricate governance structures with a multiplicity of project management teams and steering committees. The increasing external complexity, therefore, seemed to foster internal complexity in formal coordination and resource allocation processes, which hurt the ability to make timely responses in a changing environmental context.

Interactive processes between center and periphery

So far, it has been evident from the findings that strategy is effectuated and experienced at different locations and levels of the organization. The center tends to formulate the general strategic trajectory, whereas the periphery mainly provides input and executes. Furthermore, it has been exemplified how the contextual settings may influence how strategy is carried out. Finally, it has been shown how strategy is made up of both intended and emergent activities that can originate from the center as well as the periphery. However, in the present company emergence seemed to predominantly originate from the center. Hence, the following will look further into the center-periphery interaction.

Interactive processes and a knowledge gap

As evident from the interviews, there is general consensus that the organization had a multitude of avenues for interactive processes. The interactive processes involve line managers when they complete action plans in the formal strategic planning processes to fulfill general strategic aims. They also entail formal processes for ongoing monitoring and coordination, such as, steering committees, performance reviews, capital allocation processes, strategy updating processes and workshops. The interactive processes also took informal forms such as ongoing communication, interactive dialogue and serendipitous encounters. Hence, it is clear that the interviewees agree that various forms of interactive communication take place in the company. Despite these interactive processes, it is apparent that several interviewees noted a knowledge gap between the periphery and the center of the organization. This could illustrate that not all insights are easily transferred to the central apex despite the ongoing communication activities. Even though the ongoing involvement could have various benefits, some interviewees also reported negative aspects of bottom-up involvement.

> "The inclusive bottom-up approach often focuses on the present situation, and it is hard for the people involved not to be a bit conservative around the formulation of objectives, as they know that they will need to execute it themselves. So if you ask them 'how high can you jump?', they will always try to maintain a balance between on the one hand being perceived as ambitious and on the other hand not promising something that they cannot keep" (Interviewee 2).

At the same time, external consultants were used extensively in the company, and one of the main tasks accomplished by these consultants seemed to be to collect relevant insights from within the organization to develop, test and asses various hypotheses used as solutions to deal with specific emergent tasks. Hence, there were peripheral insights that seemed to have value in these strategic projects but the information was just collected and brought forward by consultants.

> "Best practice within strategy development is that you make a hypothesis: To support or reject the hypothesis, you list up several assumptions. So if the hypothesis is x, then y and z must be true. You then research whether or not these things are true, and if they are not, then your hypothesis cannot be true either... And then you must formulate another hypothesis […] External consultants typically run around and collect massive amounts of input" (Interviewee 11).

Some of the interviewees echoed the notion that frontline employees were among the first to sense emerging trends that could have strategic importance for the firm.

> "Frontline employees who provide customer support tend to be faster to sense trends than central managers, as they are often confronted with questions from customers" (Interviewee 13).

All the while, there were formal processes in place to track, review and discuss ongoing developments on operational performance outcomes. However, it seemed as if these updated insights were not effectively communicated to top management as the following quotes illustrate.

> "I talk a couple of times per month with the local strategy officers from the business lines about their progression in terms of the execution of their plans. These insights are then aggregated and communicated to the top management team each month and to the board every quarter […] My role is to translate what is happening out in the business lines to the top management team […] There are a lot of operational insights that do not reach top management" (Interviewee 12).
>
> "Strategy takes place at many levels in the organization […] There is a gap between the top-down driven strategy and the frontline employees

> who will execute it. The gap is substantial. This is because there is little information flowing in the other direction" (Interviewee 10).

The seeming gap in insights can be a logical consequence of communication from many middle managers where they are required to prioritize and filter the information that moves upwards through the organizational ranks.

> "Each link in the information flows from the bottom to the top has an advantage and a disadvantage: The advantage is the filtering function. The disadvantage comes when to filter works too well […] When ideas and insights do not move up, it is not because the middle managers are stupid – it is because they are doing their jobs. Their function is to make sure their employees are doing their jobs and delivering what they are expected to do" (Interviewee 2).

Formal and informal issue selling

A result of the environmental reality of the company is that organizational slack is limited and the resource allocation process is centralized. Issue selling is considered an important activity among middle managers in the company as a way to get access to needed resources. Both formal and informal types of issue selling were identified as several interviewees explained when it would be beneficial to pursue formal processes for issue selling, and when it would be beneficial to pursue more informal avenues for selling an issue to higher organizational ranks. However, the specific approaches seemed rather idiosyncratic to specific individuals in the organization. This suggests that issue selling behavior is very diverse and that specific strategies may be inherently individual and context specific.

A formal avenue for selling an issue is the business case, which typically denoted a quantified argument for the proposed response to the issue that takes into account various assumptions and scenarios. The described business case is generally presented and discussed with the relevant decision makers based on rational analyses commensurate with the planning school of strategy formation. In a similar vein, the presentation of the business case for responding to a certain issue often benefits from being presented as an element of a strategic narrative that illuminates a greater strategic plan.

> "In a company like [ours], you are always going to be four steps ahead if you have a business case compared to if you have a gut feeling" (Interviewee 2).
>
> "This organization tends to follow those who have a plan. So if you are good at developing your own plans; breaking it down into certain must-win-battles and explaining the importance of this plan to stakeholders - then you can create your own direction […] I have always felt that people listened to me, if I opposed an idea or viewpoint. It all comes down to the arguments. You need to have facts and arguments ready - and then you should challenge" (Interviewee 3).

These quotes reflect the organizational emphasis on rational analytics and plans and convey the importance of crafting a persuasive business case based on rigorous analyses as well as the ability to present it as a part of a greater strategic narrative. Consequently, these formal rituals of analyses, business cases and plans all played important roles in the more formal issue selling processes.

The informal issue selling approaches entail various dimensions, and were highly idiosyncratic to the individuals performing the actual issue selling activities. One strategy for informal issue selling would entail indirect mentioning of an issue around a person in near proximity of key decision makers who are able to bring the issue forward more effectively and with more credibility. This indirect form of issue selling leverages networks and social intelligence.

> "It is always a game: A part of it is also to place relevant information in the Finance department, if there is something that you know has a certain cost. In that case it can be a good thing to mention it to someone around the Finance department […] I can mention a problem around someone that I know will talk about the issue with a certain person who can act on it" (Interviewee 6).

As resources for large scale investments are difficult to obtain up front, it is similarly observed among certain interviewees that large scale projects are funded by persuading key decision makers to invest in smaller projects that in conjunction pursue a consistent chain of

strategic activities. This kind of issue selling is predominantly informal, as the process is characterized by informal talks and lobbying by leveraging relevant internal networks.

> "Rome was not built in a day: So we know that we will not get all of the needed resources up front. But we need a sufficient amount to get an initial foundation that we can build upon. In that way, other projects will fund the next steps on the road. My role is then to small-talk with relevant people about the possibilities of having a modern business intelligence platform" (Interviewee 5).

It should be noted that formal and informal issue selling processes are typically not enacted as binary categories. Most issue selling processes comprise aspects of formal as well as informal processes to get an issue sold to the relevant decision makers. Hence, most middle managers have to navigate and master both domains to obtain resources and influence the strategic process in favor of emerging initiatives.

Circumventing formal processes

The formal processes can be seen as obstacles for orchestrating timely firm responses to evolving market dynamics. Hence, a number of instances exist where determined employees by-pass formal processes to be able to launch envisioned initiatives. The individuals circumvented formal processes as they saw them as an obstacle for timely launch of their desired initiatives.

> "Everybody knows that if you want results and you have seen an opportunity in the market that you want to respond to within 3-5 months, then you must 'cheat' the system" (Interviewee 3).
>
> "I am known as a person who may by-pass formal processes. I would rather ask for forgiveness than for permission" (Interviewee 13).

One instance of the circumvention of formal processes in the company was the launch of 'product a'[8], which combined telecommunications with unlimited access to certain digital entertainment offers (e.g., music, magazines and streaming of tv-series, movies etc.) within one of the sub-brands of the organization. The combined package of telecommunications and aggregated content secured a unique position in the marketplace, and was brought about by the CEO of the sub-brand, who circumvented the formal processes to realize the initiative and

[8] As the company is anonymous, the names of the described products have been entitled 'product a' and 'product b'.

become first-mover in the industry as an aggregator of content. The intricate processes leading up to this initiative was explained by several interviewees.

> “Take the [product a] example: [Interviewee 3] was first hired in December/January this year. His predecessor had laid out a strategy for [the sub-brand]. When [Interviewee 3] comes on board he is new, he wants to make his own imprint and he believes that the way forward is [product a]. In that case we will not stand in the way just because it does not follow the predefined strategy. We will rather say: ‘It seems like a sensible initiative - of course, you should go execute that idea’. In that specific case [Interviewee 3] in principle changed the entire strategy, and that is fine" (Interviewee 1).

Interviewee 3 further explained how he perceived and enacted the process from idea to launch, and what his rationale was for approaching the initiative in this manner.

> "I became the CEO of [the sub-brand] in January and thought that [we] had historically missed the boat on many opportunities. I saw this mega trend of smartphones and digital services, but no telecommunications companies had taken the role of being an aggregator... Which I thought was spot on for a telecommunications provider... So I spent the first month saying to the organization: 'Hey guys – there is a huge opportunity here'. I got quite a lot of support around that idea in my team. So we put it on the plan in February: Let us make a blockbuster product" (Interviewee 3).

In juxtaposing the formal processes with the strategy for circumventing them, interviewee 3 could explain the underlying rationale for pursuing the observed maverick behavior.

> "We developed [product a] in 4 months. If I were to do it following the official processes, I would have to start by writing a one-pager, which would subsequently be sent to quotation: We would have spent a lot of time in reviews and committees, which would have taken the first month. So I put together a team and said 'we will do this and it is our sole focus', despite the fact that I did not have the mandate to do so. Due to the coherent focus on this task, we managed to get the deals in place

in only 4 months […] … That would NEVER happen following the formal processes" (Interviewee 3).

The example illustrates maverick behavior, as formal processes were circumvented, and as this supposedly happened unbeknownst to the top management team. However, this example was not the first time an individual employee in the organization had developed a creative concept on his own, which turned out to become popular in the marketplace. Some years earlier a functional manager developed an online music service, 'product b', that was offered as a part of the mobile telephone package (Andersen, 2013). This autonomous responsive initiative provided the company with a strategic edge for several years. Yet, several interviewees re-called how the functional manager had only been able to pitch this idea to the CEO, because external consultants helped him by-pass the formal processes.

> "[Product b] was an idea from a guy within the organization who pitched the idea at a workshop where external consultants were present, who subsequently brought the idea to [the CEO]" (Interviewee 3).

The story about the creation of product b, which became known as a popular and innovative service, illuminates how conventional processes may be circumvented to surface novel ideas from within the organization to top management. It was similarly emphasized by some of the interviewees noting that the idea most likely would not had survived if conventional lines of communication had been pursued, as the novelty of the idea looked risky.

> "Often the top management team will bring in external consultants who can say 'I know exactly how this problem can be solved - you need to do A, B and C and my people can do the analyses. So all your own guys need to do is to execute'. This is extremely addictive for a top management team: To get someone who can take insights from within the organization and bring it directly into the offices of the top management team without mid-level interferences. That is what external consultants can do" (Interviewee 2).

This quote also emphasizes the role of external consultants as bringing insights from the periphery in the organization to the top management team thus circumventing formal processes. Even though these examples explicate how initiatives have been developed locally and formal processes circumvented to get them launched, it should be emphasized that the majority of

emergent initiatives were introduced through formal processing where a member of the top management team supported the initiative. Hence, emergence has predominantly been driven from the top, rather than emerging spontaneously from the periphery.

DISCUSSION

This study was motivated by an urge to gain deeper insights into how deliberate and emergent strategy-making modes interact in different organizational settings and competitive contexts given the prominence of the two modes in the strategy literature (e.g., Burgelman and Grove, 1996, 2007; Mintzberg, 1978, Mintzberg and Waters, 1985). A number of empirical studies have uncovered aspects of the strategy process but from quite different theoretical vantage points (e.g., Bower and Gilbert, 2005; Eisenhardt, 1989a; Jarzabkowski, 2008; Lovas and Ghoshal, 2000; Mintzberg and Waters, 1982; Mintzberg and McHugh, 1985; Siggelkow, 2001, 2002; Whittington, 2007). In a recent study Mirabeau and Maguire (2014) conducted a qualitative study showing how autonomous strategic initiatives were the precursors to realized emergent strategy in a Canadian telecommunications company. Hence, we wanted to extend the perspective to consider the possible interaction between intended and emergent strategy-making modes around both induced and autonomous strategic initiatives in an organization operating in a different but comparable high-velocity industry context. Our findings illustrate that a highly competitive and hostile context conditions a process of reduced organizational slack in the form of money, time and human resources that makes it difficult for organizational members to take and engage in autonomous initiatives. The competitive pressures and a strong corporate heritage cause strategic initiatives to primarily emerge as deliberate actions induced by the strategic apex around top management. This creates an information gap between the ongoing experiences obtained from the operational encounters in the periphery and the perceptions of decision-makers at the center. This organizational context makes managerial maverick behavior necessary to drive new autonomous projects by breaking the rules and circumventing the formal resource allocation processes.

These findings provide an intriguing contrast to the emphasis and importance ascribed to autonomous initiatives as the drivers of eventual strategic renewal (e.g., Burgelman, 1991; Burgelman and Grove, 1996). The fact that tight centralized resource allocation and cost cutting controls reduced organizational slack also demonstrate that local autonomy and dispersed decision power are insufficient means to drive autonomous initiatives as is often assumed (e.g.,

Andersen, 2004; Andersen and Nielsen, 2009). This finding is also incongruent with general assumptions behind the idea that many important resource allocation decisions are carried out at lower hierarchical levels since this may not be the case unless there is a sufficient level of organizational slack (Bower, 1982; Bower and Gilbert, 2005). Consequently, the findings in this study do not completely echo the B-B process model of strategy-making observed in other telecommunications companies (Mirabeau and Maguire, 2014).

These findings can be explicated with the metaphor used by Mintzberg and Waters (1985) arguing that strategy-making seems to walk on two feet, one deliberate and the other emergent. In the present study we introduced and observed more nuanced process elements including two top-down deliberate intended and adaptive strategy-making modes and two bottom-up emergent and issue selling modes. Given the particular organizational setting and competitive industry context of the case company, we do not observe the often implied harmonious walk between the left (induced) foot and the right (autonomous) foot. In this case, one foot (deliberate intent/induced emergence) driven from the central apex around top management seems to walk fast and determined. The other foot (autonomous initiatives/issue selling) deriving from the organizational periphery does not seem to walk to pace. This loss of cadence, or rhythmic flow, is partially caused by the hostile competitive context where economic reality seems to condition a process of reduced organizational slack and tight expense controls with highly formalistic resource allocation procedures. As a consequence, the two (or four) feet do not walk together in harmony. To avoid the consequence of the imbalanced pace between induced and autonomous initiatives, or projects, we observe a managerial maverick behavior that tries to reinstate the balance by circumventing the rules and just do what they think is right. Incidentally, this behavior is selectively condoned by top management supposedly in recognition of the situation. Drawing on the argument from Welch et al. (2011), the case provides contextualized explanations that add important nuance to other studies including Mirabeau and Maguire (2014) where the organizational setting and competitive industry context influence how induced and autonomous projects drive intended and emergent strategy. The study provides empirical validation of interacting deliberate intended and spontaneous emergent strategy processes as outlined here. However, the study has limitations in terms of generalizability. Although it is appropriate to use single cases (Flyvbjerg, 2006; Mirabeau and Maguire, 2014; Yin, 2003) generalizing from a single case study should be done with caution. Here, we draw upon Yin's

(2003) notion of analytical generalization, as the findings are applied to add nuance to existing theory. The study similarly relies on contextualized explanations (Welch et al., 2011) and provides theoretical arguments from the case analysis to generalize findings.

A model for strategic emergence

Our study highlights how strategic emergence may unfold in a highly competitive and hostile industry, by considering two alternative views on emergent strategy: One imposed by top management (Quinn, 1979, 1980) and one deriving from dispersed managers (Mintzberg, 1978, 1994). The findings echo that logical incrementalism and emergent adaptive initiatives induced by top management are important in this specific setting and context (Quinn, 1979, 1980). Hence, the study suggests that the underlying concepts might be useful foundations for further investigations. As the organizational setting conditions internal processes of reduced organizational slack and increasing controls over resource utilization, the strategic emergence generally does not emanate from autonomous initiatives as implied by other empirical strategy process studies (e.g., Burgelman and Grove, 2007; Mirabeau and Maguire, 2014). Our study finds that emergent strategy initiatives are either driven by top management or derive from hard issue selling or brute circumvention of formal procedures adhering to a managerial maverick behavior. These findings suggest that this is a consequence of the competitive industry context and a corporate heritage from past ownership structures. Hence, our findings add nuance to the strategy process studies and uncover how context influences the balance between centrally induced strategy and dispersed responses and initiatives. All interviewees note frequent interaction between functional and hierarchical managers and that strategic issue selling indeed does take place. Yet, a majority of them report a seeming chasm between the environmental insights held among people operating in the organizational periphery and the knowledge held by managers around the corporate apex. This pinpoints a need for more effective means of interacting end exchanging updated environmental information, which somehow dissipates despite a myriad of coordinating project teams, working groups, and management committees aimed at exchanging knowledge on corporate activities.

In view of the theoretical perspectives that initially informed this dynamic abductive study we found that a conventional intended strategy-making process with extensive planning exercises plays an important role coupled with induced initiatives from top management in line with an incremental logic (Figure 2). In contrast we find weak influence from autonomous

initiatives as suggested by the emergent strategy perspective partially because tight controls leave little resource slack to enable local actions even though frontline employees sense a need to respond, and partially because the information flows are filtered. The existence of an information filter from the periphery to the center makes it difficult to sell strategic issues to top management that otherwise could obtain championing support for autonomous initiatives that could lead to realized strategy outcomes. Instead we observe maverick behavior among a few entrepreneurial people that break the formal rules of the organization to push individual ventures deemed to be in the best interest of the company.

---- Insert Figure 2 here ----

These findings illustrate how induced emergence and reduced means for local reactions to emerging issues seem to hinder timely responses to issues that are sensed on an ongoing basis by frontline people engaged in operational activities. These circumstances can explain why there seems to be a gap in insights between the center and the periphery, despite the fact that all interviewees recognize the extensive interactive issue selling processes within the company. The centralized resource allocation processes seem to pose a challenge to the local autonomy, as a lack of slack resources reduces the ability to engage in autonomous initiatives, which leads to deviant behavior among some of the interviewees. When this notion is combined with time consuming formal strategy-making and resource allocation processes, a certain level of constructive deviance may be needed to orchestrate timely responses. These findings add nuance to the B-B model, by explicating the boundary conditions for available organizational slack and the degree of formalization in the resource allocation processes (Bower and Gilbert, 2007). The findings offer insights that suggest a need for strategy-as-practice research focused on conjoint strategy processes that facilitate both intended and emergent strategy formation (Mintzberg, 1978; Minzberg & Waters, 1985). This can provide a deeper understanding about how intended and emergent strategy practices evolve contending that the interaction between the two strategy modes can have both value creating and value destroying potential. The present study predominantly conveys the contextually driven challenges of balancing the two strategy-making modes, but it may be possible to facilitate ongoing interaction between the two modes building on the principles of organizational learning and interactive control systems (Simons, 1990, 1991, 1994, 1995). Given the importance that interactive strategy-making evidently has in practice, and the idiosyncratic nature of the concept as a function of both environmental context and

organizational path dependence, future research could further explore the circumstances under which the interaction between intended and emergent strategy practices is value creating and when it is value destroying.

Maverick behavior and constructive deviance

The study provides empirical evidence of the importance of managerial maverick behavior while discussing the circumstances under which it may arise. Albeit the concept has some idiosyncratic characteristics, managerial maverick behavior is a conceptual sibling to constructive deviance (Vadera, Pratt and Mishra, 2013; Warren, 2003), creative deviance (Mainemelis, 2010), and informal innovation (Hartmann and Hartmann, 2015). Warren (2003) sees constructive deviance as departure from reference group norms that rather conforms to a higher normative standard (hyper-norms). This resonates very well with the observed motivations of deviant behavior reported in our study, where the interviewees typically pertain to do what is deemed to be right for the company and customers. As argued by Vadera, Pratt and Mishra (2013), intrinsic motivation, felt obligation and psychological empowerment seem like the plausible mechanisms that underpin the behaviors we observe, although more research is needed in different settings to validate this. Managerial maverick behavior, in our findings, entails the circumvention of formal processes and rules that can halt decisions on the initiatives or delay time-to-market extensively.

Implications for strategy

The study uncovers the contours of an extended model of interactive strategy-making specifying different interplays between induced and autonomous strategies in an organization operating in a highly competitive and hostile environment. This reflects a different balance between deliberate and emergent strategy-making modes than has been observed within comparable organizations operating in a similar industry. In the competitive and hostile environmental context intended and induced initiatives predominate in the strategy-making process and there is less evidence of resource committing decisions at lower hierarchical levels. Emergent strategies typically arise more out of maverick behavior rather than from autonomous initiatives as proposed by the Bower-Burgelman process model of strategy-making. In short, the two feet of strategy-making, deliberate and emergent, seem to display different cadences under different contextual conditions cautioning a more nuanced view on the complex interactive strategy-making process.

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Figure 1. Strategy as resource committing decisions taken across the organization over time

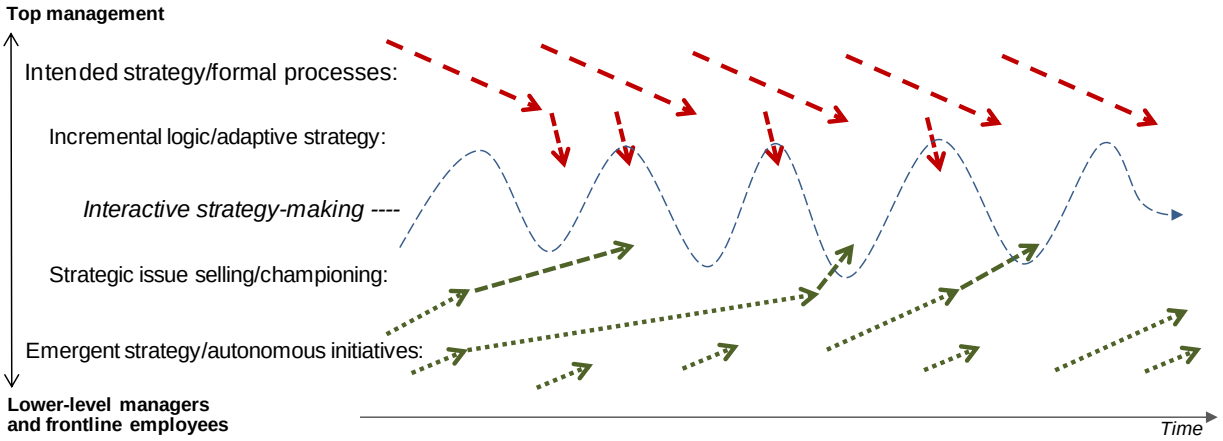

Figure 2. An extended model of strategy formation with interacting intended and emergent strategy-making modes

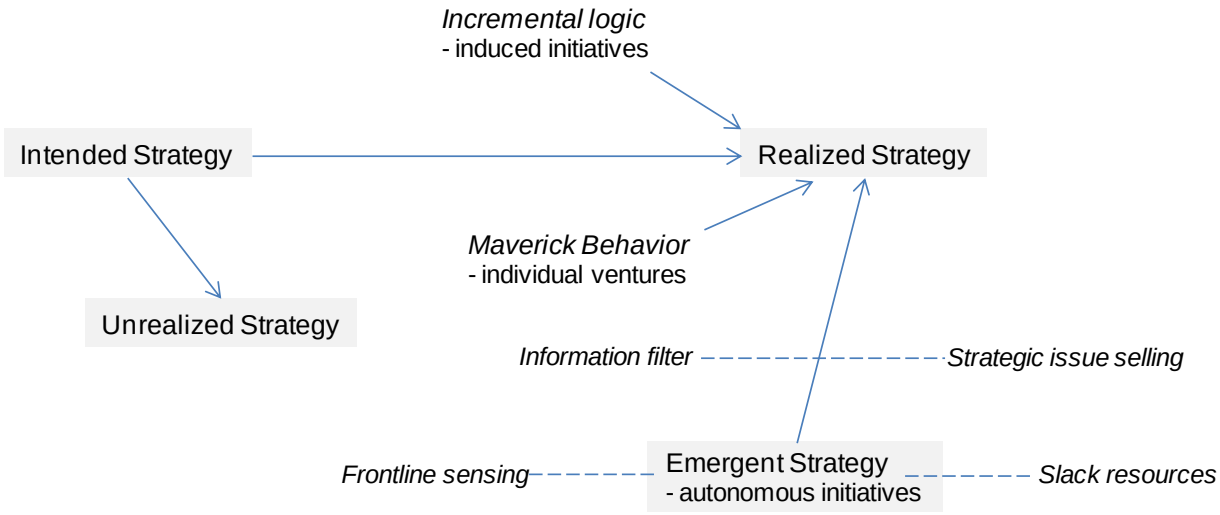

Table 1. Overview of the diversity of data collected for the study

DATA SOURCE	TYPE	DESCRIPTION	USE IN ANALYSIS
Archival Data			
• Annual reports • Press releases • Presentation of company • Intranet • Slides/Documents	- Internal - Qualitative and quantitative - Secondary	Predominantly data from the period 2013 – 2015. However, several sources dated further back. In continuation of this, accounts of corporate history explicated events as far back as 1875.	Mainly used to provide an understanding of the historical developments of the company, as well as its contemporary situation and strategic processes.
• Articles • Databases • Reports • Research projects	- External - Qualitative and quantitative - Secondary	Predominantly data from 2013-2015. However, certain data sources dated further back.	Used to provide a rich understanding of the context of the company. Furthermore, they validated findings from the other sources of data
Participant Observations			
• Meetings • Casual observations • Field notes	- Internal - Qualitative - Primary	Casual observations within the company (in 5 different departments in 4 business divisions). Participated in various meetings. Participant observations of various day-to-day events.	Used to provide an in-depth understanding of processes within their real-world context. Ongoing meetings and discussions helped validate findings from the other sources of data.
Interviews			
• Semi-structured interviews	- Internal - Qualitative - Primary	13 interviews were conducted. 11 were formal and taped. 2 were informal and subsequently not taped. Interviewees were from both center and periphery.	Used to provide an understanding of the intricate strategy making processes. The 2 informal interviews were solely utilized to validate the findings of the 11 formal interviews.

Table 2. Categorization of interviewees by function, location and hierarchical level (indicates the number of interviewees within each category)

Functional area		**Organizational position**		**Hierarchical level**	
Function	#	***Location***	#	***Level***	#
Corporate Strategy	3	Center	5	VPs and above	3
Analytics	2			Managers	7
Technical	3	Periphery	8	Analysts and internal consultants	3
Other	5				

Table 3. Strategy-process elements (codes) identified across multiple

– Analytical coding scheme (CODES):	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Interviewee 7	Interviewee 8	Interviewee 9	Interviewee 10	Interviewee 11	Interviewee 12	Interviewee 13
1. Intended strategy/formal processes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Incremental logic/adaptive strategy	✓	✓	✓		✓						✓	✓	✓
3. Emergent strategy/autonomous initiatives	×		✓		✓	✓	✓	✓		×	×	×	
- Organizational slack/excess resources	×		×	×	×	×	×	×	×	×	×	×	
5. Interactive strategy-making processes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
- Information gap between center and periphery		✓	✓		✓	✓	✓	✓	✓	✓		✓	✓
4. Strategic issue selling/championing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
- Circumventing formal processes/Maverick behavior		✓	✓		✓	✓	✓	✓		✓		✓	✓
- External complexity mirrored internally		✓		✓						✓			✓
- 'Equity story'/shareholder value	✓	✓				✓						✓	
- Frontline sensing/the role of external consultants		✓	✓		✓						✓	✓	✓
- Agility/strategic responsiveness		×	×	×	×		×			×	×	×	×

Note: ✓indicates the presence of the phenomena; × indicates the absence of the phenomena

CHAPTER 4

ADVANCING STRATEGIC ISSUE MANAGEMENT: AGGREGATING JUDGMENTAL FORECASTS OF CALL CENTER EMPLOYEES[9]

CARSTEN PEDERSEN
CARINA ANTONIA HALLIN
SIGBJØRN TVETERÅS
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ABSTRACT

The ability to sense and respond to emerging strategic issues in a timely manner is a key management concern that has important performance implications. This study seeks to advance strategic issue management by focusing on the aggregated judgmental forecasts of call center employees. The strategy literature has long alluded to the notion that boundary spanning employees who front the business have updated experiential insights. However, these arguments have predominantly relied upon anecdotal evidence. In contrast, our study compares the predictive accuracy of call center employees with customers in forecasting firm performance. We report findings from a forecasting study in a highly volatile telecommunications industry that assessed the accuracy of more than 150,000 individual forecasts based on 13,531 survey responses from both frontline employees and customers collected over several months. The empirical findings provide promising prospects for advancing strategic issue management research and practice.

Key words: Forecasting, strategic issue management, strategic responsiveness, collective wisdom, frontline employees

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INTRODUCTION

Strategic issue management (SIM) is one of the earliest concepts introduced in strategic management research (Ansoff, 1975; 1980). It broadly refers to how organizations detect and respond to strategic issues. It follows that SIM purports to improve the organization's capacity to adapt and to learn (Hedberg 1981). However, despite its prominence for strategic management research and practices in the 1980s, little empirical evidence exists that has followed up on Ansoff's (1980) early work on SIM. In a response to improve organizations' capacity to detect emergent strategic issues, some authors have argued for the importance of including the lower-level stakeholders' experiential insights (Babenko and Sen, 2015; Potter and Lipinski, 2009). This study investigates this proposition by collecting frontline employees' and customers' judgmental forecasts (i.e., forecasts based on subjective opinions) about different aspects of firm performance. Changes in firm performance will in many settings be perceived as strategic issues, and therefore of high relevance to the SIM framework. The judgmental forecasts are aggregated for the employees and customers respectively to yield 'collective' forecasts, which thereafter are compared and scrutinized for its accuracy and information value for inclusion in SIM. Specifically, strategic issues refer to developments or trends that emerge from an organization's internal or external environments; they are perceived to have the potential to affect an organization's performance (Ansoff, 1980; King, 1982). Strategic issues are diverse and can include e.g., a department's failing performance, a new technology in the market, lack of trust in managerial performance or declining rate of customer satisfaction.

Studies find that lower-level employees, who are most closely associated with the firm's operational activities, accumulate intricate knowledge about day-to-day operational factors that influence performance, and, therefore also of strategic relevance (e.g., Bower and Gilbert, 2007; Burgelman and Grove, 1996; Mirabeau and Maguire, 2014). For example, as noted by Mintzberg (1987, p. 69) in an anecdotal study, "the salesperson who finds a customer with an unmet need may possess the most strategic bit of information in the entire organization". Other studies provide conceptual, anecdotal and empirical evidence of the important role of frontline employees in accumulating information (Andersen, 2015; Hallin, Tveterås and Andersen, 2012; 2013; Tushman and Scanlan, 1981; Potter and Lipinski, 2009).

Although the above studies provide some justification that the frontline matters in detecting strategic issues, there are scant empirical evidence to match this claim. Furthermore, the strategic issue management (SIM) literature has traditionally overlooked the integration of frontline employees' judgmental forecasting for advancing strategic decision making. That is, to the authors' awareness, discussion of using aggregated judgmental or 'collective' forecasts from the frontline are absent in the literature.

Our article contributes to the existing efforts to advance SIM for strategic management research and practices by addressing the research gap on lower-level stakeholder involvement in SIM. Specifically, we enhance SIM by introducing aggregated judgmental forecasting of frontline employees and customers of strategic issues. The burgeoning field of prediction markets has provided initial quantitative evidence of employees' collective predictive accuracy of performance measures (KPIs) (e.g., Babenko and Sen, 2015; Chen and Plott, 2002; Cowgill, Wolfers and Zitzewitz, 2009). Yet, this aggregation mechanism is arguably ill-suited to identify unknown strategic issues, since it is setup to only deal with clearly defined variables with a known range of outcomes. Recent empirical studies have made interesting inroads into leveraging frontline versus executive insights and providing initial quantitative evidence that frontline employees can predict financial performance (Hallin et al., 2012). Another study finds that decision makers rate the inputs from customers as conveying a better understanding of customer demands than inputs from internal employees (Poetz and Schreier, 2012). Yet, it has been shown that customer reviews may be misleading (Anderson and Simester, 2014), and some studies question if positive customer feedback is always a signal of future success (Anderson, Lin, Simester and Tucker, 2015). Specifically, it could be that employees obtain more relevant knowledge for detecting strategic issues due to their daily presence in the operational environment compared to its customers who normally deal with the organization from the outside and on an infrequent basis. Hence, it is relevant to compare the value of employee and customer insights before considering its inclusion in SIM.

Our research questions are central to advancing SIM: What are the strategic issues frontline employees (call center employees) and customers can predict and identify for SIM? What is the predictive accuracy of frontline employees compared with the predictive accuracy of customers? What are the implications of integrating aggregated judgmental forecasting of strategic issues for SIM research and practice? The present study meets current interest into the

accuracy of select groups of knowledgeable forecasters, emphasizing the most consistently accurate individuals within a crowd, and the underlying factors that explain their accuracy (Mannes, Soll and Larrick, 2014; Tetlock, 2005; Tetlock and Gardner, 2015).

The study draws on an extensive data collection of employees' and customers' judgmental forecasts aggregated to form time-series data. The data were collected from the employees and customers of a European telecommunications provider during 2013-2016. The data amounted to 13,531 usable survey responses of which 12,490 (1,868 call center and 10,622 customer responses) consisted of survey responses collected monthly to comprise aggregated judgmental time-series data of predicted firm performance that, in turn, was compared to actual firm performance in distributed lag models and equivalence tests. The findings show that call center employees can collectively predict firm performance of various strategic issues. The same accuracy cannot be found for the customers, although they include substantially more respondents. The study has important implications for SIM and confirms the value of integrating the forecasts of frontline employees into the SIM process to identify emergent issues.

The article proceeds as follows: We revisit the SIM literature and develop theoretical reasons for expecting frontline employees to be able to predict various strategic issues and more precise than customers (Hypothesis 1 and 2). The next section presents the study's contribution to firm performance and SIM where we suggest the value of such aggregated judgmental forecasts from the frontline for SIM (Hypothesis 3). The next section presents our research context: A particularly volatile national market in the European telecommunications industry. Thereafter, we present our research design and methods. We then present our results with regard to the different hypotheses. The article concludes by discussing the importance of the findings for SIM research and practical implications.

THEORY AND HYPOTHESES

Strategic Issue Management

The notion of strategic issues, and the systematic processes for managing them, can be traced back to Ansoff (1975, 1980), although the seeds for the concept were planted in the early 1960s with Aguilar's (1967) emphasis on environmental scanning. SIM is a continuous process that focuses on detecting and responding to early warnings of emerging issues. Ansoff (1980, p. 133) defines strategic issues as "… a forthcoming development, either inside or outside of the organization, which is likely to have an important impact on the ability of the enterprise to meet

its objectives", and strategic issue management systems as "… a systematic procedure for early identification and fast response to important trends and events both inside and outside an enterprise" (p.134). Put differently, SIM can be likened to an ongoing SWOT analysis. Ansoff (1980) himself describes the process using the concepts from this framework. In this manner, the challenge of conducting a SIM framework can be rephrased as identifying the items on the SWOT list and determine their relative importance in terms of the strength/weaknesses and threat/opportunities matrix. Hence, strategic issue management (SIM) systems enhance an organization's capacity to adapt and to learn from the environment (Dutton and Ottensmeyer, 1987).

The early work on SIM focused on practice-based systems, procedures and processes that were predominantly prescriptive and normative in nature. Since SIM was conceived, various sub-activities originating from the concept, i.e., strategic issue selling and strategic issue diagnosis (SID), have subsequently been explicated and unfolded into distinct and rich literary streams (figure 1). The following will further explicate the relationships between SIM, SID and issue selling.

[Insert Figure 1 here]

The work by Dutton et al. (1983, 1987, 1993) marked an interpretive turn in the study of strategic issues, where the focus was placed on the cognitive and social processes of diagnosing and selling strategic issues – rather than focusing on the system itself. SID refers to "… those activities and processes by which data and stimuli are translated into focused issues (i.e., attention organizing acts) and the issues explored (i.e., acts of interpretation)" (Dutton, Fahey and Narayanan, 1983, p. 307-308). Much of the early work on SID characterized the process as being inherently top-down. Moreover, for our purposes it is important to note that one of the key outputs of SID is judgmental forecasts about firm performance (Dutton, Fahey and Narayanan, 1983). Hence, judgmental forecasts have historically constituted an important outcome of SID inputs and processes, illustrating the connection between the two.

Whereas the interpretive turn initially focused on SID (e.g., Dutton, Fahey and Narayanan, 1983; Dutton and Webster, 1988; Dutton, 1993), subsequent attention later transitioned to the processes of strategic issue selling (e.g., Dutton and Ashford, 1993; Dutton, Ashford, Wierba, O'Neill and Hayes, 1997; Dutton, Ashford, O'Neill and Lawrence, 2001).

Issue selling is defined as "… individuals' behaviors that are directed toward affecting others' attention to and understanding of issues" (Dutton and Asford, 1993, p. 398), where the focus has predominantly been on middle managers' issue selling in organizations. Where Ansoff (1975, 1980) focused on a formal process for dealing with strategic issues, Dutton (1993) dealt with the organizational and interpretive intricacies of strategic issues.

Three take-aways are prevalent at this point: First, the literatures explicitly stress that SIM and SID are per definition managerial. For instance, it is noted that, "No issue is inherently strategic. Rather, an issue becomes strategic when top management believes that it has relevance for organizational performance" (Dutton and Asford, 1993, p. 397). Common to both literatures, therefore, is this distinct emphasis on the managerial role in perceiving strategic issues at the expense of frontline stakeholders who are the most exposed to sense performance changes. That is, the role of frontline employees' insights has remained elusive in the SIM/SID literatures. However, the many tales of firm disruption where top managers have been blindsided by emerging disruptive threats suggest that employees' insights have strategic value (Christensen, Anthony and Roth, 2004). Second, although the literature has emphasized the selling activities of lower-level employees, the focus has predominantly been on middle managers. While this literary stream does not pay much explicit attention to the frontline, it is useful in understanding the organizational intricacies that hinder timely warnings from lower-level employees reaching top management. Third, the literature on SID establishes that one of the outcomes of the SID process is judgmental forecasting of performance. This is arguably an essential element of SID, and we further argue that aggregated judgmental forecasts of medium-term performance from frontline employees can be utilized to extend and advance SIM.

Aggregated Judgmental Forecasting of Strategic Issues

As most firms are arguably exposed to the turbulence of an ever-changing business environment, it becomes apparent that the value of strategic forecasting and subsequent timely firm responses is substantial (Duus, 1999). In such a dynamic perspective, it also becomes clear that the selling process outlined in the literature on strategic issue selling is time consuming. Aggregating forecasts about industry and context specific organizational strategic issues circumvents intricate issue selling processes (Dutton and Ashford, 1993). Hence, it is relevant to focus more on updated experiential insights about issues obtained from day-to-day operations. Duus (2008) has identified three different research directions within strategic forecasting: (i)

Futures research (ii) the school of strategic warning, and (iii) strategic business cycle forecasting. The present study identifies with the second research direction comprising 'strategic warning', as it has its roots in the early work on SIM by Ansoff (1975, 1980) and focuses on obtaining timely warnings of the early signals of emerging strategic issues.

A literature review on various strategic issues revealed that there is an overall lack of empirical work on various measures of strategic issues in the SIM literature. It is expected that measures of strategic issues in many instances are firm specific. For example, using updated employees' judgmental forecasts over consecutive periods Hallin et al (2012, 2013) found support that frontline employees in the hospitality industry can both predict development in dynamic and operational capabilities. Measures in these studies include such dimensions as competitiveness, innovativeness, team performance, managerial performance and employee learning and motivation. Other studies from different industry contexts look into measures of e.g., service quality of frontline employees (Millán and Esteban, 2004), customer recommendation (Reichheld, 2006), awareness of changes in the environment (Wu et al., 2010), product and service quality, and improvement capabilities (Peng et al, 2008) – but are not explicitly tied to the literature on SIM. Moreover, several of the various items can comprise latent theoretical constructs. For instance, it is argued that items concerning interdepartmental collaboration and the managerial problem solving ability can comprise a measure of interactive strategy-making, as they reflect the horizontal and vertical communication flows and actions entailed within the concept (Andersen, 2015). Moreover, interactive strategy-making can be said to resonate with SIM as it deals with firm responsiveness.

Aggregated Judgmental Forecasting of Call Center Employees and Customers

Call center employees in the service industry have an important role as a sub-group of frontline employees. Arguably, they operate in a uniquely exposed position where they are some of the first to be confronted with impending changes. In addition they are in a position where they can link both internal and external developments. This corresponds to boundary-spanning behavior of frontline employees (Tushman and Scanlan, 1981) or customer-oriented boundary-spanning behaviors (Bettencourt, Brown and MacKenzie, 2005), as they are employees who interact directly with the market. In a similar vein, Potter and Lipinski (2009) note that "organizations with more boundary spanning personnel are more likely and capable of receiving and assessing information on competitive actions, thus allowing them to respond faster" (p. 163-164). Each

workday they interact with a wide range of customers, and they similarly experience internal developments that may affect their ability to perform their tasks. Hence, frontline employees build up a comprehensive understanding of operational conditions, and they should therefore be able to collectively sense and predict issues that may subsequently influence firm performance, i.e., strategic issues.

Call center employees can be distinguished from other frontline employees in two important aspects: (i) Their interactions with customers are typically diverse as they are not bound to physical encounters, and (ii) their direct interactions with other employees, or at least interdepartmental interactions, tend to be less prevalent than other frontline groups due to the characteristics of the job (Pentland, 2014). Both of these aspects should increase ability, diversity and independence of the employees – three essential determinants for group level predictive accuracy (Page, 2007; Surowiecki, 2004). While other studies have indicated that frontline employees may have collective sensing abilities, it can be expected that call center employees, in particular, may be an outlying subset among the general frontline group that can be exceptional collective forecasters of firm performance. However, this has not explicitly been tested in previous studies.

Similar to frontline employees, customers build up experiential insights based on ongoing interactions with various company touch points. Therefore, customers may share a similar collective capability to forecast firm performance on various measures. However, the literature is divided on the potential quality of customer insights: Whereas some literary developments emphasize that certain users have important insights of immense value for the organization (Poetz and Schreier, 2012; von Hippel, 2005), other studies warn of the potential dangers of listening to and relying exclusively on certain customer voices (Anderson, Lin, Simester and Tucker, 2015; Anderson and Simester, 2014; Christensen, Anthony and Roth, 2004; Verganti, 2009). The literature is also divided on the issue of which customers should be listened to: Whereas some studies argue that firms should be listening to users who lead developments before they impact mainstream users (Von Hippel, 2005), other studies argue that firms should be listening to the customers who lag behind the bulk of the market (Christensen, Anthony and Roth, 2004). These differences may stem from the fact that the studies differ in their assumptions regarding the diffusion patterns that exist in markets. That is, do trends get diffused from the most specialized users to the rest of the market (Von Hippel, 2005), or do they

become diffused from non-users and the least advanced users to the mainstream market (Christensen, Anthony and Roth, 2004)? One plausible explanation for these diverging assumptions could be that diffusion patterns can differ substantially from industry to industry. A related argument is that both diffusion patterns are possible, and from a SIM perspective, management needs to be aware of both competitive trajectories, as they both comprise important strategic issue domains.

It is evident that the literature is divided on the usefulness of customer inputs and the foresight of users. Despite this disagreement, customer insights are often relied upon in practice by decision makers. It follows that it is relevant to measure the validity of customer insights, in addition to comparing it to that of call center employees. In other words, there is a need to quantify and test the accuracy of customer forecasting in relation to those of call center employees.

Accuracy in Aggregated Judgmental Forecasting

According to Page (2007), predictive accuracy of groups is determined equally by ability and diversity. That is, the extent to which the employee and customer groups can provide accurate predictions is determined by both their collective ability (i.e., their knowledge) and the diversity of cognitive models (i.e., how much they differ in their individual forecasting) (Page, 2007). Hence, these aspects can minimize collective forecasting errors. Albeit the customers have knowledge of their own intentions, and the intentions and opinions of fellow customers in close proximity of them, their informational repository about the firm is normally smaller than that of call center employees. Hence, the present study will compare the collective insights from customers with call center employees. Here, the customer insights will also be utilized to control for any size effects, which makes it possible to rule out the mere size of the groups as an explanatory factor behind any forecasting accuracy of call center employees.

Call center employees build up experiential insights into what works and what does not, based on their daily interactions with customers and operations. They can therefore provide updated assessments and predictive judgments about firm performance. In addition, if call center employees provide their forecasts independently of each other, and their predictions entail sufficient signal and diversity, the aggregated group average can be accurate (Page, 2007).

Strategic issues in the telecommunications industry may concern any number of issues, but an example could be factors related to the volume of customers handled and can

entail forecasts of the number of incoming calls. Here, 'incoming calls' is defined as the aggregate number of inbound calls to the call center i.e., support, sales and service calls. Moreover, the same predictive capability of the measure could be expected among the customers, but not to the same extent as call center employees as the latter group has more interactions with a broader span of customers than do customers themselves. Hence, we suggest the following:

> *Hypothesis 1: Call center employees can forecast the amount of incoming calls more accurately than customers.*

As call center employees interact with customers daily they should also be able to forecast the level of satisfaction among customers. In order to illustrate the potential magnitude of collective call center insights, consider the following thought-up example: In a given call center, assume that each employee on average takes 160 calls from customers per week. This means that on average each employee would handle 640 calls from customers every 4 weeks. Let us further assume that 500 employees work in the call center. As a result, the collective workforce in the call center would, on average, handle an estimated 320,000 customer calls every 4 weeks. If we furthermore take into account that each call would take 380 seconds on average, then every four weeks the collective call center employee-base would have spent approximately 33,778 hours speaking to customers. Hence, call center employees collectively comprise a repository of updated insights into what works and what does not work in daily operations, and how the general customer base perceives various aspects of the company, as they engage in customer-oriented boundary spanning behaviors (Bettencourt, Brown and MacKenzie, 2005). Consequently, we suggest;

> *Hypothesis 2: Call center employees can forecast customer satisfaction more accurately than customers.*

Call center employees are exposed to internal and external operational conditions that may eventually affect the financial performance of the organization. Important internal conditions

that affect the capacity of adaptive firm responses concern e.g., collaboration between departments and the problem-solving ability of top management. Interdepartmental collaboration and managerial problem-solving therefore reflect important dimensions of 'interactive strategy-making', as they illustrate capabilities needed for joint collaborative learning between the central apex and organizational periphery in creating adaptive firm responses to ongoing developments. Here, 'interactive strategy-making' refers to vertical integration and use of information alongside horizontal coordination and adjustments in local actions that in combination give rise to interactive tactical considerations between central reasoning and peripheral actions dispersed across the organization (Andersen, 2015). That is, the interaction is constituted by ongoing updated experiential insights from the *organizationa*l *periphery* and regular interpretation and integration across the organization from the *corporate center*. Decentralized updated observations are important in a dynamic and complex environment, and central interpretation is important in order to regularly assess consequences and necessary adaptive initiatives by the organization. Interactive strategy-making is related to adaptive firm responses, and consequently, can predict changes in revenue. Hence, we suggest that;

> *Hypothesis 3: Call center employees can forecast developments in strategic issues that are linked with firm revenue.*

In sum, the joint contribution of our three hypotheses to the strategic management literature is the assumption that call center employees possess superior insights both about specific issues and operational developments in a variety of dimensions of subsequent relevance to firm performance i.e., strategic issues. That is, we assume that accurate forecasting of call center employees and customers on strategic issues can advance strategic issue management.

INDUSTRY CONTEXT AND DATA

The Telecommunications Industry

The research context is a large telecommunications company in a national market in Europe during a particular volatile period. The national market is characterized by a decrease of full-time employees (from 17,244 in 2008 to 12,950 in 2014), as well as decreasing revenue in the same period resulting from an intense price competition and price sensitive consumers in the

detracting market segments. Our case company is a large telecommunications provider which has a broad product portfolio within e.g., telephony, broadband, cable tv and online entertainment. The case is considered relevant to study the forecasting performance of call center employees versus customers as the organizational context is driven by an evolving environment conducive to the research topic. The company is multidivisional with various sub-brands under the group umbrella. However, the study is delimited to forecasts of a specific sub-brand in the consumer market. One of the authors were employed in the case company in a dedicated research position during the study which secured unique access to data and an understanding of the context.

Research Design and Procedure

The study is designed using an aggregated judgmental time series forecasting framework based on survey data collection over consecutive periods. That is, judgmental forecasts are aggregated across the individuals in each group, employees and customers, for each period. As this is repeated over several consecutive periods for each of the two groups and for each item the data form time series of aggregated judgmental forecasts. The study comprises various research phases that progressively built upon each other (see figure 2).

[Insert Figure 2 here]

Research Phase 1

The purpose of research phase 1 was to review various literatures within e.g., strategy, operations management and marketing to identify relevant scales and items that could comprise relevant measures of strategic issues in the specific telecommunications context. After the initial lists of scales and items were compiled, the quality and applicability for the context was assessed.

First step was to assess validity and reliability of measures generated from the theory. Second step was to obtain face validation of the content and domains of the items from relevant managers at two divisions, employees and customers of the company. Third step was to send out a survey (survey 1) to respectively call center employees and customers, where they were asked to assess (i) the various items' effect on firm performance on a scale from 1 to 5, and (ii) rank overlapping items in order to also rank their mutual importance in terms of their potential effect on firm performance. Furthermore, the respondents were asked to provide suggestions for novel aspects to include in the surveys, if they thought it was lacking in the

initial lists, which resulted in qualitative comments and suggestions. The results of survey 1 led to a quantitative prioritization of the items (on both interval and ordinal scales) for the respective call center survey and customer survey that were necessary to design the two respective surveys.

Principal component analyses (PCA) on 18 items (employee survey) and 17 items (customer survey) were performed on the two datasets in order to obtain a preliminary exploratory understanding of the variables. In addition the PCA functions as an early assessment of potential multicollinarity issues. PCAs were conducted on these initial items with orthogonal rotation (varimax), where the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for the call center survey was 0.933 and for the customer survey was 0.918, which are 'superb' according to Field (2009). All KMO values for individual items were well above the acceptable limit of .5 (Field, 2009). Bartlett's test of sphericity χ^2 (153) = 2980.256, p< 0.001 for call center employees – and χ^2 (136) = 5065.989, p< 0.001 for customers. These results indicated that correlations between items were sufficiently large for PCAs. The results were subsequently discussed and face validated by relevant managers at the case company in order to secure practical relevance of the leading indicators. This led to the design of the two surveys: One for the frontline employees entitled 'operational performance survey' and another for the customers entitled 'reputational capabilities survey'. These surveys were then pre-tested on the employee and customer groups (survey 2), which resulted in minor revisions to the survey designs and wording of items, before moving to phase 2.

Research Phase 2

The purpose of phase 2 was to collect aggregated judgmental forecasting data among call center employees and customers on a monthly basis for a total of 17 months. The judgmental forecasting study was conducted monthly from February 2014 to June 2015 and included both months. This approach to data collection was inspired by the methodology introduced in Hallin et al. (2012), initially inspired by studies on the consumer sentiment index (Katona, 1951). By tracking forecasts over time, the study met the call for forecasting research that factors in the accuracy of predictions over longer periods of time in order to assess how reliable and valid they are (Denrell and Fang, 2010; Tetlock, 2005; Tetlock and Gardner, 2015). Minor revisions of the survey were made based on the insights derived from the pilot tests concerning e.g., wording, which led to the final design of the survey in research phase 2, consisting of 14 items for the call

center employee survey and 12 items for the customer survey (see appendix). Moreover, the call center employees received information of the study's purpose and plan prior the data collection.

During the data collection period, a question was added in 5 of the 17 months the surveys were conducted, asking both call center employees and customers to provide quantitative forecasts of a performance measure related to customer satisfaction: This served the purpose of obtaining an early idea of predictive accuracy, as well as to validate the indicators. These final surveys were, once again, face validated by relevant managers, employees and customers before conducting the judgmental time-series forecasting surveys. Meetings with key employees also took place continuously throughout research phase 2 to validate insights and secure practical relevance (approximately 20 meetings of an hour each was held throughout the three phases, where data and analyses were presented to and discussed with decision makers) .

The forecasting surveys were distributed each month (around the middle of the month). An email with a link was sent to the survey was sent to respectively call center employees in the company and selected customers. The respondents were given approximately two weeks to respond, with a follow-up 'reminder' email sent to them after approximately one week. The aggregated judgmental forecast data and qualitative comments were then presented to key decision makers in the case company each month during the period. This provided ongoing validation of the collected data in terms of evolving conditions sensed at the periphery of the organization, as well as provided transparency in terms of continuously presenting the forecasts prior to the actual outcomes in performance.

As the online surveys were distributed directly to the respondents' email, the procedure controlled that the responses were independent, by minimizing potentially biasing influences from third parties. No feedback on the results was provided to either call center employees nor customers during the period of testing, in order to minimize any potential influence on the subsequent estimates. Furthermore, no incentives were provided to the respondents. Newly hired employees were not included in the sample to secure a certain level of experiential ability.

Research Phase 3

The purpose of phase 3 was to synthesize the data from stage 2, and compare the collective predictions with actual firm performance data, in order to assess the predictive accuracy. This

phase was utilized to perform the statistical analyses of the time-series study and to evaluate the accuracy of the groups.

Samples

The initial survey to explore variables and assess the validity of the measures generated from the literature collected data from 200 call center employee and resulted in a response rate of 50.25% and 372 respondents among the customers producing a response rate of 14.39%. The survey generated a foundation for a refined survey which was initially tested in a pilot test. In the pilot test, data was collected from 200 call center employees generating a response rate of 46.9% and 269 respondents among the customers producing a response rate of 9%.

The judgmental forecasting study in research phase 2 collected over 150,000 monthly individual forecasts from 12,490 usable survey responses collected during the 17 month. The data collection was distributed amongst participants consisting of a broad range of call center employees and residential customers. The call center employees varied with respect to e.g., departments, function, experience – and customers varied in relation to e.g., products, geography and age. This internal variation among the respondents was deliberate with the intention of enhancing diversity in predictive models (Page, 2007). The data collected entailed a total of 1,868 usable responses among the call center employees and 10,622 usable responses from the customers, comprising a total of 12,490 usable responses). The monthly response rates varied between 21% to 42% and produced an average of 28% for call center employees, and between 16% to 8% with an average of 14% for customers in the data collection period of stage 2. Hence, the average number of respondents was approximately 110 call center employees and 625 customers per month. See Figure 3 for box and whisker plots of the respondent sizes by groups, showing minimum value, lower quartile, median, upper quartile and maximum value. The box and whisker plots illustrate that there were substantially more customer respondents than employee respondents per month throughout the entire data collection period.

[Insert figure 3 here]

Here, it is essential to emphasize that studies into the wisdom of select crowds validate insights by measuring the predictive accuracy of the crowd and not necessarily by having representative samples or large response rates (Mannes, Soll and Larrick, 2014; Tetlock and Gardner, 2015): For instance, Mannes, Soll and Larrick (2014) focus on the predictive accuracy of only a handful knowledgeable judges, and Tetlock and Gardner (2015) similarly focus on an

outlying subset of so-called 'superforecasters'. Moreover, it is well-established that predictive accuracy in prediction markets and expert forecasting is related to certain requirements not necessarily representative of the general population, as they can typically not be shared by the majority. Or as Page (2007) suggests, collective accuracy is a matter of ability and diversity.

METHODOLOGY

Aggregated Judgmental Time-Series Forecasting

We employed aggregated judgmental time-series forecasting (Goodwin and Wright, 1993) collected at fixed intervals over a period to validate the accuracy of call center employees and customer forecasts over time and link it to firm performance.

Here the notion of judgmental forecasting over consecutive time periods was combined with rationales concerning crowd wisdom (Page, 2007; Surowiecki, 2004), as the combination of forecasts can cancel out idiosyncratic noise while retaining the signal in the data (Armstrong, 2001; Silver, 2012). Hence, more accurate forecasts are made possible by averaging individual forecasts that cancel out the idiosyncratic biases that are often deemed a shortcoming in traditional judgmental forecasting methods.

Measurement of Forecasting Accuracy

Normally forecasting accuracy is evaluated using measures like mean absolute percentage error (MAPE) or mean absolute deviation (MAD). This is not possible here as those forecast performance measures requires that forecast and actual outcome are the same variable. In this study forecasts about firm performance based on the response options "worse", "same as" and "better". Thus, the standard forecasting accuracy measures are unsuitable. Instead, in this study forecasting accuracy is measured and assessed using two different statistical methods. One is equivalence testing (TOST, i.e., two one-sided t-tests), and the other is distributed lag models. The concept of equivalence testing will be explicated by a detailed description followed by an explanation of the calculation of diffusion measures and indexes utilized in the distributed lag models.

Equivalence Testing

Equivalence tests are 'inferential statistics designed to provide evidence for a null hypothesis' (Levine, Weber, Park, and Hullet, 2008, p. 199). In standard hypothesis testing, a null hypothesis of no difference between means is tested against empirical evidence. Here you can either reject the null hypothesis of no difference in favor of the alternative hypothesis of a

significant difference, or you can fail to reject your null hypothesis. These tests are typically conducted to provide support for the alternative hypothesis. However, when interested in testing for no significant, or practical, difference between two means, a standard hypothesis test cannot be utilized as evidence for the null, as a failure to reject the null hypothesis is not the same as accepting it, i.e., 'absence of evidence is not evidence of absence'.

Instead, we make use of equivalence tests, where the null hypothesis states that there is a difference in the means, and the alternative hypothesis states that there is no practical difference, which changes the burden of proof (Lung, Gorko, Llewelyn, and Wiggins, 2003; Richter and Richter, 2002; Walker and Nowacki, 2011). As noted by Levine et al. (2008): 'A significant result in an equivalence test means that the hypothesis that the effects or differences are substantial can be rejected. Hence, equivalence tests are appropriate when researchers want to show little difference' (p. 200).

Diffusion Measures

The various items were posed as questions entailing wording and framing such as "How do you think collaboration between departments will develop during the next 3 months compared to today?" with response possibilities such as "worse", "the same" or "better". The response options for the items made it possible to calculate diffusion measures, which in turn, could be aggregated into indexes. For each item in the surveys, a diffusion measure was calculated. Following prior studies on the topic, diffusion measures were calculated by subtracting the negative predictions from the positive predictions, and subsequently dividing by the total number of predictions. This number is then multiplied by 100, and 100 is furthermore added (Hallin et al., 2012). This can be expressed as follows:

$$\text{Diffusion measure} = \left[\frac{(\text{No.of "better" predictions} - \text{No.of "worse" predictions})}{\text{Total no.of predictions}} \times 100\right] + 100 \quad (1)$$

where the expression in the parenthesis can take values ranging from -100 to 100 depending on the relative frequency of "worse" and "better" responses. Indexes are subsequently calculated by taking each items's diffusion measure(s) current month, and then dividing by the sum of the same items' diffusion measure(s) in month chosen as the base period. This is then multiplied by 100 to obtain an index number to obtain a conventional index number. These aggregated judgmental forecast indexes comprise a time series to be tested against a corresponding time series of actual performance. The aggregated judgmental forecast indexes can be expressed as follows:

$$\text{Index} = \frac{\sum \text{Diffusion measure}_{i,t}}{\sum \text{Diffusion measure}_{i,o}} \times 100 \quad (2)$$

Where *i* denotes the survey item and t is the time period (and '0' is the base period diffusion measure). The index can subsequently be for one item, several items, or all items in a formative index. Whereas the diffusion measures and indexes illustrate the aggregated forecasts of the call center employees and customers, performance measures are the dependent variables to be predicted by these indexes through distributed lag models.

Distributed Lag Models

As the indexes form time series, we could utilize estimation of distributed lag models to assess the groups' judgmental predictive accuracy on the different strategic issues. Distributed lag models are commonly referred to as dynamic regression analyses, as the predictive effect of predictor x on y occurs over time and not all at once. However, a challenge to all distributed lag models is choosing the specific lag length. Due to the time constraints of the data, where the time series did not entail more than 17 months of observations model specification parsimony was required. We utilized a general-to-specific modeling strategy of reducing lag length until the highest significant lag with 3 lags as a maximum: As the posed questions asked the respondents to forecast 3 months ahead of time, we did not use more than 3 lags in any of the specified models to let the analyses reflect the posed time-horizon. Durbin Watson tests were run on the specified models to detect potential presence of autocorrelation

Dependent Variables

We used various measures that directly, or indirectly, reflected firm performance – and were of paramount importance to the decision makers in the company. All dependent variable data was provided by relevant analysts in the case company. The performance measures investigated were (i) number of incoming calls, (ii) customer recommendation score and (iii) revenue. These will be explained in the following.

Number of Incoming Calls

'The number of incoming calls' represents the total number of incoming calls for the sub-brand in a month. The measure entails a variety of calls such as billing calls, retention, sales and support. Albeit the number of incoming calls is not necessarily a direct measure of firm performance, the measure is essential for the performance of the firm, and thus, is relevant from a strategic perspective. The measure was included as it entails a strategically important measure for the firm that has historically been difficult to forecast – and as both call center employees

and customers should have a reasonable chance of predicting the measure given their ongoing telephonic interactions. Moreover, the inherent properties of the measure help provide some additional validity to the two performance measures, as it adds robustness to the main argument of the study, and it cannot be directly influenced by either group utilized to forecast the development.

Customer Recommendation Score

We utilized a 'recommendation score' as a performance measure because it has broad application as a significant performance measure in the specific telecommunications industry. At the same time it was considered a performance measure that both call center employees and customers could relate to. The recommendation score reflects the customers' general willingness to recommend the company to friends or colleagues. Hence, it is a measure that reflects customer satisfaction as an operational event with different quality outcomes. The satisfaction measure is an adapted version of the net promoter score by Reichheld (2006). Like the net promoter score it directly asks customers: "How likely are you to recommend our company to a friend or colleague?" indicated on a 10-point Likert scale. Unlike the net promoter score, the recommendation score follows a different method in its subsequent transformation of values. Instead of measuring the percentage of promoters of the company, i.e., those who say 9 or 10 on the scale, and subtracting the percentage of detractors, i.e., those answering 0 through 6 (Reichheld, 2006), the recommendation score measures the general average of the customers' willingness to recommend the company on a 10-point Likert scale. This is subsequently multiplied by 10 to transform it into an index with a possible range from 0 to 100. Hence, a general average of 5.7 on the 10-point Likert scale will produce 57 as a recommendation score. That is, 57 reflects a general tendency of the customers to recommend the company.

Revenue

Linking call center predictions with financial firm performance makes it possible to argue for their relevance to strategic issue management. 'Revenue' is an essential measure for companies, and within the telecommunications industry it is largely determined by a function of market demand, competition, and pricing. The measure was chosen as it made it possible to link predictions directly to financial performance, i.e., strategic performance. Moreover, the set of strategic issues in the forecasting survey could arguably be seen as leading indicators for the measure.

To run forecasting tests, the performance variables in the distributed lag models are calculated as relative performance measurements against a competitive benchmark such as a comparative company or the rest of the industry, i.e., the supernormal performance. An advantage of this measurement is to filter out effects of common market movements so that predominantly firm specific variations remain (Hallin et al. 2012). This can be expressed as follows:

$$Pfm = \Delta ln(\text{Performance of firm A})t - \Delta ln(\text{Performance of firm B})t \quad (3)$$

That is, the performance measure of firm A at time t, is calculated as the difference between the performance of firm A and the performance of firm B at time t. In other words, Pfm measures the comparative performance of the firm in relation to a relevant benchmark. In the present study, the performance of the case-company is compared to an equivalent company in the same group, i.e., a directly comparable brand in the same organization. The two entities are comparable as they focus on the same segment of household/residential customers, and they offered many similar products and services. Combined, the two companies comprised a substantial share of the local market (~50%). In the present study, the performance measures were defined as the supernormal monthly difference in logarithms of the measures for the company compared to the relevant benchmark company. Taking the first difference of the variables not only removes any inherent trends in the time series data and hence makes the time series stationary unless it is integrated of an order of two. Moreover, taking the first difference of ln transformed variables approximates percentage change (Hallin et al., 2012, 2013). Thus, it corresponds to the standard measures of supernormal performance, that is, the percentage return above or below the industry average.

Independent Variables

The project made use of several measures as independent variables in the various models. The independent variables were calculated as indexes that reflected theoretical concepts that were expected to predict the dependent variables. As previously noted, the items predominantly stemmed from the literature, but were abductively adapted to fit the empirical setting and industry context. The specific independent variables, or predictors, will be explicated below. Due to the overall lack of empirical work on measures of strategic issues in the SIM literature, the present study relied upon, amongst other, previous studies on frontline employees' predictions of development in firm-level capabilities in the hospitality industry, where measures

include such dimensions as innovativeness, interdepartmental collaboration and managerial problem-solving ability (Hallin et al. 2012, 2013). Other studies from different industry contexts of relevance for the specific case company look into measures of e.g., service reliability (Millán and Esteban, 2004), customer recommendation (Reichheld, 2006), awareness of changes in the environment (Wu et al., 2010), product and service quality, and improvement capabilities (Peng et al, 2008).

Call Center Employee Forecasting Survey

The call center employee survey utilized four different measures as independent variables in the different distributed lag models: (i) *The operational performance barometer (OPB)* which included all items in the survey (ii) *predicted service quality index (PSQI),* which is an adapted version of a sub-scale on service reliability (Millán and Esteban, 2004) that incorporates customer recommendation (Reichheld, 2006) (iii) *the interactive strategy-making index (ISM),* which is an adapted version of two items from Hallin et al. (2013) that convey the vertical and horizontal information flows that are similarly inherent in the theoretical concept of 'interactive strategy-making' (Andersen, 2015), and (iv) predicted *ability to provide fast service* (item 2 in appendix), which is a specific item from the adapted version of a sub-scale on service reliability (Millán and Esteban, 2004). The *interactive strategy-making index (ISM)* incorporates two adapted items from Hallin et al. (2012, 2013), i.e., interdepartmental collaboration (item 8) and managerial problem-solving ability (item 12). Albeit these items were not combined as an index reflecting interactive strategy-making in the original studies, the items reflect the horizontal and vertical information flows inherent in interactive strategy-making (Andersen, 2015), and the concept resonates with the purpose of the original design of the items.

Customer Forecasting Survey

The customer survey utilized three different measures as independent variables in the different distributed lag models: (i) *The reputational capabilities barometer (RCB)* entails all of the items in the survey, and like the frontline survey it similarly has (ii) *predicted service quality index (PSQI),* which is an adapted version of a sub-scale on service reliability (Millán and Esteban, 2004) that incorporates customer recommendation (Reichheld, 2006), and (iii) predicted *ability to provide fast service* (item 2 in appendix), which is a specific item from the adapted version of a sub-scale on service reliability (Millán and Esteban, 2004).

We now turn to a presentation of the empirical results of the prediction data.

RESULTS

First, we present results on the predictive accuracy of call center employees and customers forecasting incoming calls using distributed lag models. Second, we present results on the predictive accuracy of call center employees and customers forecasting customer recommendation score using both distributed lag models and equivalence tests. Third, we present predictive accuracy of call center employees forecasting revenue using distributed lag models.

Aggregated Judgmental Forecasting of Number of Incoming Calls

Table 1 presents the regression results for the distributed lag models of the number of incoming calls. Table 1 shows the distributed lag results of the item 'the ability of the company to provide fast service' (item 2) as a predictor of the number of incoming calls. As evident in the table, call center employees' forecasts of the item has a highly significant coefficient from the first lag ($p<0.001$), and therefore, the model can predict a substantial degree of the developments in the number of incoming calls (adjusted $r^2 = 0.6955$, $p<0.001$).

[Insert Table 1 here]

The linkage between predicted ability of the company to provide fast service and the number of incoming calls suggests that call center employees incorporate capacity management considerations when forecasting whether or not the enterprise can provide fast service in the near future compared to today. The sign of the coefficient is as expected (negative), as a positive anticipation of the firm's ability to provide fast service must incorporate a decrease in the number of incoming calls and vice versa. We similarly tested if the customer respondents' forecasts of the same item could provide equivalent predictive accuracy of the number of incoming calls. However, the results from the customer data turned out to be non-significant, which makes the predictive accuracy of the measure unique to the call center employees in our case. By the evidence provided in table 1, we reject the null hypothesis in favor of hypothesis 1 that call center employees can forecast the number of calls more accurately than customers.

Aggregated Judgmental Forecasting of Customer Recommendation Score

Table 2 and 3 present the results on the distributed lag models predicting the customer recommendation score.

Table 2 shows the distributed lag results of OPB and RCB as predictors of the recommendation score performance measure. We assessed the predictive accuracy of the call center employee

barometer (OPB), including all items, on the recommendation score performance measure. OPB does show significant results of predictive accuracy. The equivalent barometer for the customers (RCB), entailing different items, were similarly tested with non-significant results[10].

[Insert Table 2 here]

[Insert Table 3 here]

As it can be seen from table 3, there are 5 items (comprising the PSQI) that each have a comprehensive theoretical rationale for being leading indicators of the recommendation score. The PSQI shows an improved predictive accuracy for the call center employees, but still only non-significant results for the customers. The PSQI allows for a more direct comparison of the predictive accuracy between frontline employees and customers. The findings from table 3 are interesting, as they suggest that call center employees may collectively be able to predict customer satisfaction, in contrasts to the customer themselves who appear to have greater challenges with predicting the relevant developments. This finding can benefit from additional evidence in order to validate it. Thus, we move on to equivalence test results on quantitative forecasts of the customer recommendation score.

In the equivalence tests we asked both call center employees and customers to provide quantitative forecasts of next month's recommendation score in order to quickly obtain an assessment of the predictive accuracy during the data collection period (item 15 in the frontline employee survey and item 13 in the customer survey). Moreover, the forecasts entailed in these items are quantitative in nature, and hence, qualitatively different than the forecasts tested in the distributed lag models. The main challenge with equivalence tests lies in specifying what constitutes a *practical* difference, i.e., an equivalence interval. We utilized an equivalence interval of 3.47 percentage points: This interval was determined by calculating the standard deviation of the historical recommendation scores among residential consumers in the period January 2012 to December 2013. This provided an equivalence margin that resonated with historical developments.

[Insert Table 4]

[Insert Figure 4]

[10] It must be noted that the items entailed within OPB and RCB are not identical, as illustrated in the appendix. However, both surveys were designed to have a predictive effect on e.g., customer recommendation. Moreover, the PSQI can provide a more direct comparison on similar items.

As it can be seen in table 4, the actual difference in means is within the specified practical difference threshold. Furthermore, with a max p-value of 0.0345, the null hypothesis of a significant difference between the groups can be rejected in favor of the alternative hypothesis that there is no practical difference between the two groups. This suggests that call center employees have collectively provided accurate forecasts of the performance measure during the period as a whole, i.e., the forecasts were equivalent to the general level of the performance measure during the period of testing.

[Insert Table 5]

[Insert Figure 5]

As it can be seen in table 5 of customer forecasts against the outcome, the actual difference is near the specified practical difference threshold. With a max p-value of 0.3819, the null hypothesis of a significant difference between the groups cannot be rejected in favor of the alternative hypothesis. This suggests that customers could not provide sufficiently accurate forecasts of the measure.

Consequently, both the distributed lag models and the equivalence tests reject the null hypothesis in favor of Hypothesis 2 that call center employees can forecast the customer recommendation score more accurately than the customers.

Aggregated Judgmental Forecasting of Revenue

The items 'Ability of top management in solving problems' and 'Collaboration between departments' reflect 'interactive strategy-making', as they deal with ongoing vertical and horizontal communication flows and actions (Andersen, 2015). Hence, a formative index of interactive strategy-making, i.e., interactive strategy-making (ISM) comprising these two items, has been utilized as a predictor in Table 6. Here, the third lag is highly significant ($p<0.01$), and the model itself has an adjusted r^2 of 0.7964 ($p<0.01$).

[Insert Table 6 here]

The results suggest that the call center employees are able to sense changes in certain operational conditions reflecting interactive strategy-making that, in turn, is a good predictor for relative revenue changes. Hence, by the results in table 6, we find support to reject the null hypotheses in favor of H3.

DISCUSSION

This study was motivated by a desire to empirically test the predictive accuracy of the collective call center employee workforce on various measures related to firm performance in a specific organizational setting, and benchmark their accuracy with that of customers, given the recurring notion in the strategy literature of important competitive insights often remaining among lower-level employees (e.g., Burgelman and Grove, 1996; Mintzberg, 1987). A number of studies have looked into related subsets of the problem, yet from quite different theoretical, methodological and empirical perspectives (e.g., Bower and Gilbert, 2007; Dutton and Ashford, 1993; Mirabeau and Maguire, 2014; Rerup, 2009), with predominantly qualitative and anecdotal data as the basis for their rich arguments and findings. Hence, we wanted to extend this perspective to call center employees, where we assess their predictive accuracy on a broader range of performance measures and compare their accuracy to that of customers. Consequently, we build upon previous work into the issue to propose and present evidence for the utility of aggregated judgmental forecasts of call center employees as a fruitful trajectory for advancing the practice of SIM.

Our results suggest that call center employees are able to predict developments of strategic importance to their firm, which echo previous studies that have looked into the predictive accuracy of other frontline employee groups. Moreover, our results suggest that the collective wisdom of call center employees may be useful in early identification and diagnosis of emerging strategic issues (Ansoff, 1980; Dutton, 1993), and that the collective wisdom of call center employees may provide a promising alternative to conventional consumer research, considering the reported accuracy of call center forecasts of consumer satisfaction compared to those made by the customers themselves. Hence, the findings add important nuance to the debate of the value of employee versus customer insights in understanding the demands in the market (Poetz and Schreier, 2012).

These results provide an intriguing contrast to the conceptualized top-down driven SIM models that dominate the literature (e.g., Ansoff, 1980; Dutton and Asford, 1993), and that similarly feed into the classic strategy debates concerning interactions between deliberate and emergent strategies (Mintzberg and Waters, 1985) and the importance of respectively autonomous initiatives and logical incrementalism in driving strategic renewal (Burgelman and Grove, 1996; Mirabeau and Maguire, 2014; Quinn, 1980). Our findings suggest that call center

employees may, collectively, be at the forefront of operational developments that may turn out to have a strategic effect. Consequently, they constitute an untapped wellspring of updated experiential insights that may warn of impending opportunities and threats of utmost importance to the performance of the firm and strategic decision making. Although 'absence of evidence is not evidence of absence', it is still counter-intuitive how accurate call center employees seemed to be compared to customers; but this finding may plausibly be industry-specific.

The collective wisdom of call center employees

The study provides empirical evidence of the predictive accuracy of call center employees while discussing the idiosyncratic circumstances that may make them a unique group of collective forecasters among frontline employees in general. Albeit the collective predictive accuracy has previously been proposed, our findings suggest that call center employees may constitute a unique subset among the frontline employees, as their jobs have inherent characteristics that are conducive to obtain collective wisdom in predicting operational conditions related to firm performance. For one, it has been found that the internal 'interaction' in the form of informal communication between call center employees is often limited due to the conditions and requirements in the job (Pentland, 2014). This forms the basis for creating independent and diverse estimates or predictions among the employees. Secondly, the mere volume of customer calls that call center employees handle is both extensive and diverse. Hence, this secures a certain level of updated experiential insights of a broad and diverse customer base. Thirdly, the work of call center employees tends to be extensively quantifiable in nature. Hence, they have an inherent understanding of the operational performance at an individual and aggregated level that seems to make them capable and accustomed to think in terms of quantifiable developments.

One particularly interesting finding was that the call center employees in our study could collectively predict customer satisfaction and loyalty, although the customers themselves could not – despite being more respondents. The following reasons comprise a combined explanatory mechanism: Firstly, call center employees are in an exposed position where they obtain updated experiential insights into what works and what does not work from a multitude of sources. Secondly, they are in contact with a broad and diverse customer base each day, meaning that they build up both predictive ability and diversity in viewpoints (Page, 2007). Thirdly, frontline employees are boundary spanning and can link different perspectives (Bettencourt, Brown and

MacKenzie, 2005). Hence, we argue that call center employees often have more collective knowledge than they are typically being probed for. This suggests that the collective wisdom of frontline employees can be applicable in SIM.

An interactive model for strategic issue management

Our study highlights how experiential insights from call center employees may provide an ongoing sense of operational changes that can influence firm performance. The findings suggest that call center employees have updated insights about certain operational issues that may be 'hidden' or relatively difficult to surface for key decision makers at the central apex. Consequently, the study emphasizes the utility of collective call center employee forecasts for diagnosing the early signals of seemingly minor operational developments that may subsequently, and often to the surprise of top-level managers, influence the general performance of the firm i.e., become strategic issues. Taken together, these aspects point towards an interactive model of SIM (Ansoff, 1980), where the collective wisdom of call center employees is a pivotal input to the diagnosis of strategic issues (Dutton, 1993). Although the interaction between center and periphery has indirectly been conceptualized as strategic issue selling (Dutton and Asford, 1993), it is argued that the literary stream on strategic issue selling has had a unilateral emphasis on the role of middle managers in selling strategic issues to top management. The interactive model to SIM/SID is furthermore essential in dynamic environments, as managerial SID has been conceptualized as running 'on automatic' (Dutton, 1993), which may speak to the need for collective bottom-up sensing to question individual subjective biases among decision makers at the central apex.

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Figure 1 Relationships between the different strategic issue concepts

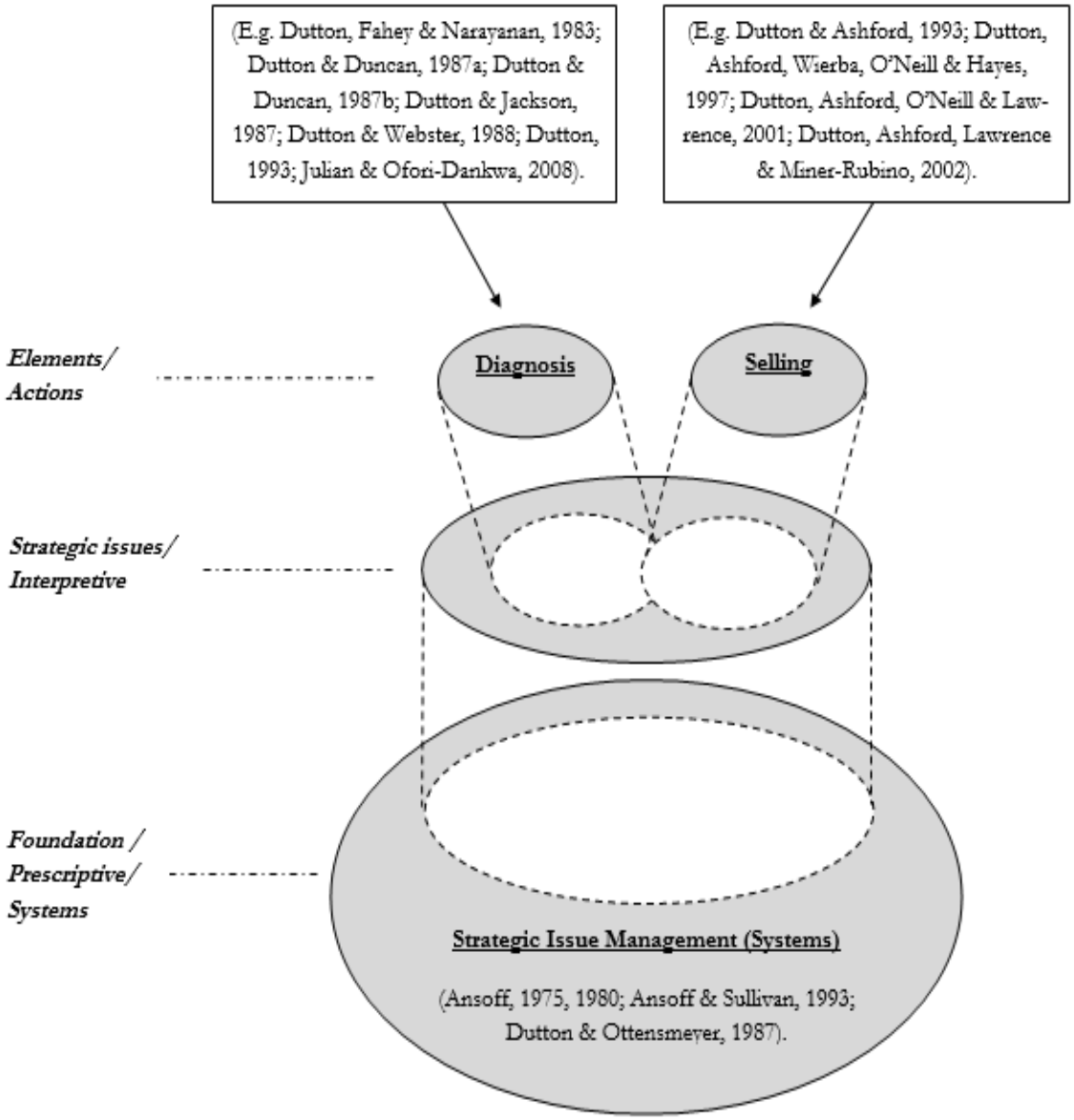


Figure 2 Overview of the phases of the research project

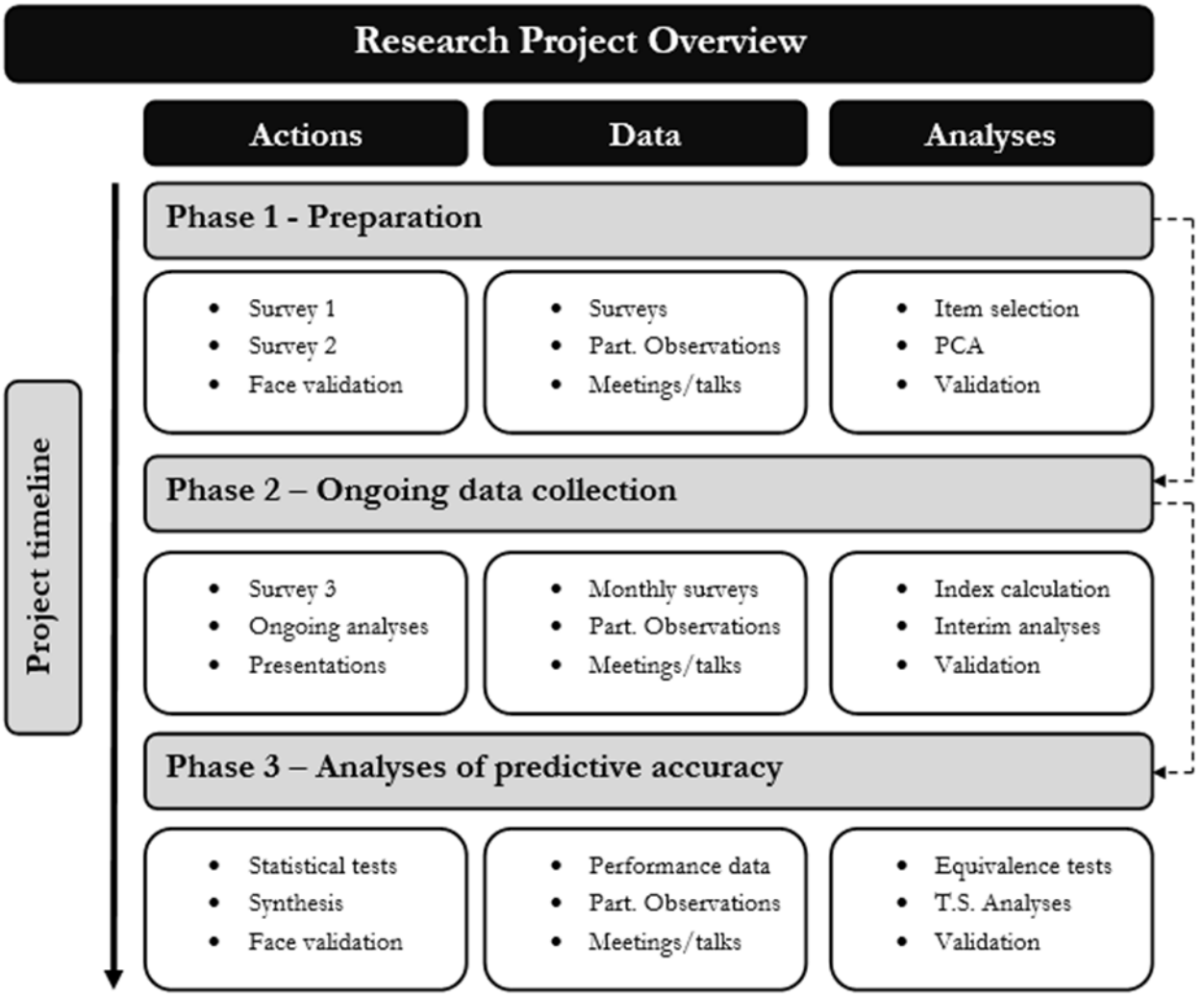


Table 1 Prediction contest between call center employees and customers on incoming calls

Dependent variable	**Call center employees** *Incoming calls*		**Customers** *Incoming calls*	
Predictors	β	t	β	t
Constant	-0.002336	-0.12	-0.01307	-0.35
$\Delta lnItem2_t$	0.2772026	1.44	0.510648	0.49
$\Delta lnItem2_{t-1}$	**-0.891879*** **	**-4.71**	-0.311098	-0.30
Observations	15		15	
R^2	0.739032		0.035463	
Adjusted R^2	0.695538		-0.12529	
F	**16.9914*** **		0.2206	

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

Table 2 Prediction contest between call center employees and customers on customer recommendation

	Call center employees		**Customers**	
Dependent variable	*Recommendation score - pfm*		*Recommendation score - pfm*	
Predictors	β	t	β	t
Constant	0.0065162	0.57		
ΔlnOPBt	**0.2796132***	**2.23**		
ΔlnOPBt-1	0.1444895	1.06		
ΔlnOPBt-2	**0.4774217****	**3.05**		
ΔlnOPBt-3	**0.4827781*****	**3.45**		
Constant			0.009419	0.54
ΔlnRCBt			-0.023282	-0.04
ΔlnRCBt-1			-0.666493	-1.18
ΔlnRCBt-2			0.1153625	0.20
ΔlnRCBt-3			0.4675116	0.81
Observations	13		13	
R^2	0.684554		0.259478	
Adjusted R^2	0.526831		-0.11078	
F	**4.3402****		0.7008	

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

Table 3 Predicted service quality index as predictors of customer recommendation

	Call center employees		**Customers**	
Dependent variable	*Recommendation score - pfm*		*Recommendation score - pfm*	
Predictors	β	t	β	t
Constant	0.0009615	0.08	0.0102252	0.63
ΔlnPSQI$_t$	0.2144396	1.61	-0.276212	-0.49
ΔlnPSQI$_{t-1}$	0.0538758	0.38	-0.767257	-1.26
ΔlnPSQI$_{t-2}$	**0.5217943****	**3.32**	0.389491	0.64
ΔlnPSQI$_{t-3}$	**0.5065733*****	**3.43**	0.4924181	0.84
Observations	13		13	
R^2	0.697528		0.32691	
Adjusted R^2	0.546293		-0.00964	
F	**4.6122****		0.9714	

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

Table 4 Practical equivalence between call center forecasts and actual outcome

Specified Practical Difference Threshold	3,47
Actual Difference in Means	-0,06
Std Error of Difference	1,624241

Test	t Ratio	p-Value
Upper Threshold	-2,17332	0,0307*
Lower Threshold	2,099442	0,0345*
Max over both		0,0345*

Table 5 Practical equivalence between customer forecasts and actual outcome

Specified Practical Difference Threshold	3,47
Actual Difference in Means	-3,01
Std Error of Difference	1,479901

Test	t Ratio	p-Value
Upper Threshold	-4,37867	0,0012*
Lower Threshold	0,310832	0,3819
Max over both		0,3819

Table 6 Interactive strategy-making index (ISM) as a predictor of revenue performance

	Call center employees	
Dependent variable	*Revenue - pfm*	
Predictors	β	t
Constant	**-0.00998****	**-2.87**
$\Delta lnISM_t$	0.0416159	1.14
$\Delta lnISM_{t-1}$	0.0606585	1.27
$\Delta lnISM_{t-2}$	0.0194437	0.39
$\Delta lnISM_{t-3}$	**0.1860493*****	**4.71**
Observations	13	
R^2	0.864275	
Adjusted R^2	0.796412	
F	**12.7357*****	

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

Figure 3 Customer versus call center employee respondents

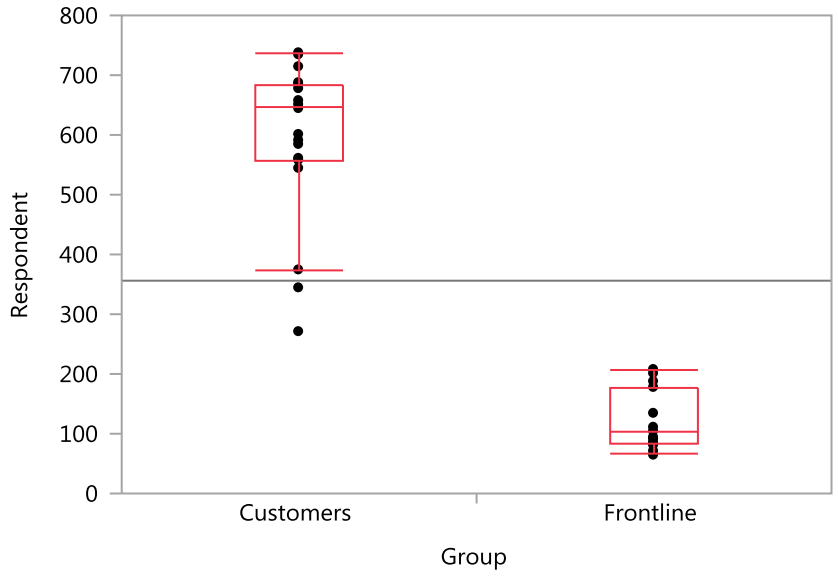


Figure 4 Practical equivalence between call center forecasts and actual outcome

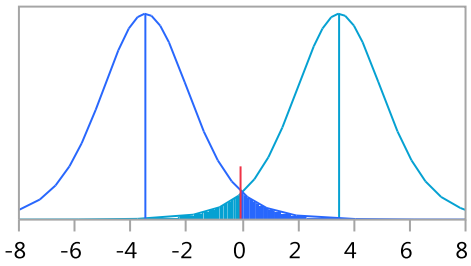
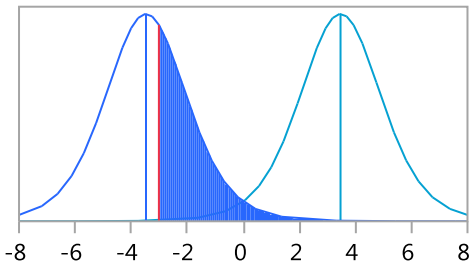


Figure 5 Practical equivalence between customer forecasts and actual outcome



Appendix: Questions and Items utilized in the surveys

Call center employee items/questions			
How do you think **[insert item]** will develop during the next 3 months compared to today? **Response options:** Worse – the same – better.	**ISM**	**PSQI**	**OPB**
Item 1: The revenue of firm x.			✓
Item 2: The ability of firm x in providing fast service.		✓	✓
Item 3: The ability of the employees in providing correct information to customers.		✓	✓
Item 4: The ability of firm x in adapting to changes in the market.			✓
Item 5: The customers' perception of the customer service of firm x.			✓
Item 6: The customers' perception of the product quality of firm x.			✓
Item 7: The number of customer ambassadors of firm x.		✓	✓
Item 8: The collaboration between departments at firm x.	✓		✓
Item 9: The ability of firm x in complying with agreed promises to customers.		✓	✓
Item 10: The employees' desire to continue working for firm x.			✓
Item 11: The ability of firm x in developing new and creative services, systems and processes.			✓
Item 12: The problem-solving ability of top management.	✓		✓
Item 13: The ability of firm x to continuously improve products.			✓
Item 14: The ability of firm x to provide services within agreed time.		✓	✓
Additional question in 5 of the 17 months (item 15): How likely do you think it is that the general customer base of firm x would want to recommend the firm to friends or colleagues during the next month? Please provide your answer on the scale below from 1-10, where 1 is 'very unlikely' and 10 is 'very likely'.			

ISM = interactive strategy-making index

PSQI = predicted service quality index

OPB = operational performance barometer

✓ = included in the above

Customer items/questions		
How do you think **[insert item]** will develop during the next 3 months compared to today? **Response options:** Worse – the same – better.	**PSQI**	**RCB**
Item 1: The reputation of firm x.		✓
Item 2: The ability of firm x in providing fast service.	✓	✓
Item 3: The ability of the employees in providing correct information to customers.	✓	✓
Item 4: The ability of firm x in providing products of high quality.		✓
Item 5: The ability of firm x in having competitive prices.		✓
Item 6: The ability of the employees at firm x to keep promises.		✓
Item 7: The perceived attractiveness of working at firm x.		✓
Item 8: The manner in which firm x treats its customers.		✓
Item 9: The ability of firm x in complying with agreed promises to customers.	✓	✓
Item 10: Your likelihood of recommending firm x to friends and colleagues.	✓	✓
Item 11: The customers' trust in firm x.		✓
Item 12: The ability of firm x to provide services within agreed time.	✓	✓
Additional question in 5 of the 17 months (item 13): How likely do you think it is that the general customer base of firm x would want to recommend the firm to friends or colleagues during the next month? Please provide your answer on the scale below from 1-10, where 1 is 'very unlikely' and 10 is 'very likely'.		

PSQI = predicted service quality index

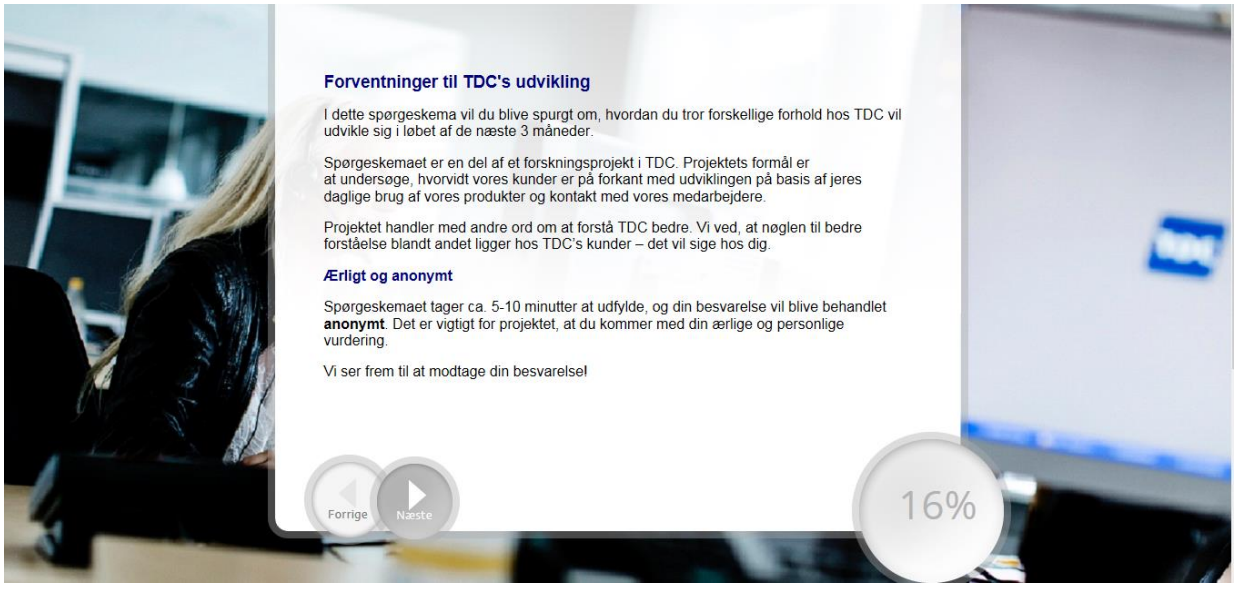
RCB = reputational capabilities barometer

✓ = included in the above

Example of managerial SIM dashboard of aggregated forecasts from frontline employees

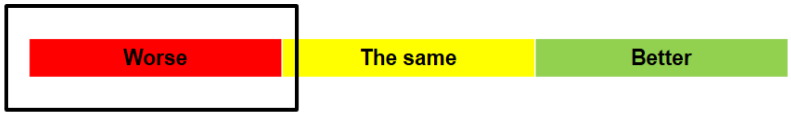
Developments over time…																	
Items	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Sparkline
Item 1																		
Item 2																		
Item 3																		
Item 4																		
Item 5																		
Item 6																		
Item 7																		
Item 8																		
Item 9																		
Item 10																		
Item 11																		
Item 12																		
Item 13																		
Item 14																		
OPB																		

Example of the frontpage for the online customer survey



Example of a survey question and how responses may typically look like

How do you think the collaboration between departments at firm x will develop during the next 3 months compared to today?



Why do you anticipate this development?

Example of answer: "It gets worse and worse with time. Often it is as if the departments are fighting to not get the customer over to them – and the result is that the customer gets thrown around between the different departments, and becomes so frustrated that he/she eventually finds another product".

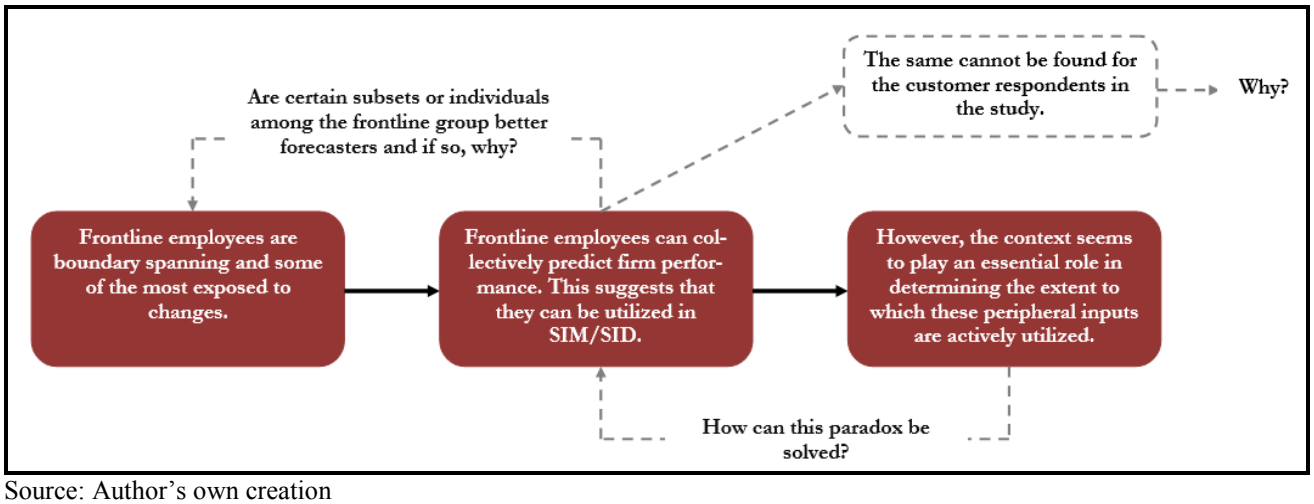
Chapter 5

Conclusion

5.1 Summary of key findings of the dissertation

In this final chapter of the dissertation, the key findings of the various papers will be summarized and tied together. Moreover, the author will seek to answer the research question(s) of the dissertation, and discuss implications, limitations and future research in view of the dissertation's results. The present study sought to advance research on SIM by proposing the use of the collective wisdom of frontline employees. Little empirical work has followed up on Ansoff's (1975, 1980) introduction of SIM. Hence, the present dissertation sought to contribute to this literary gap. Figure 5.1 shows some of the important findings of the dissertation, and some novel questions that have emerged in view of the results. As it will be explicated in the following, paper 1 makes a theoretical argument of why it is reasonable to expect that frontline employees and customers should be able to forecast firm performance. Paper 3 tests the predictive accuracy of these constituent groups, and finds that frontline employees are able to predict accurately, whereas the customers are not. Paper 2 provides an overview of the strategy-making *processes*, and finds that e.g., insights from the periphery are rarely utilized.

Figure 5.1: Key findings from the research and new emerging research questions.



Source: Author's own creation

In chapter 1, the main research question(s) of the dissertation, and its composite papers, were introduced. The main research question of the dissertation was as follows:

- **Main research question of the dissertation:** *"To what extent can frontline employees and customers predict firm performance – and how can it be utilized in SIM?"*

This main research question of the dissertation was further subdivided into specific research questions for the respective papers that comprise the dissertation. The subdivided research questions (i) operationalized the main research question (ii) provided a progressive logic to the dissertation, and (iii) in combination, provide a comprehensive answer to the main research question of the dissertation. The research question of the conceptual paper 1 (chapter 2) was as follows:

- **Paper 1:** *"How can collective wisdom be utilized in SIM?"*

The research question of the qualitative paper 2 (chapter 3) was as follows:

- **Paper 2:** *"How does intended and emergent strategy processes interact over time in a hostile industry context?"*

The quantitative paper 3 (chapter 4) had the following main research question with 3 working/sub-questions that operationalized the main research question of paper 3:

- **Paper 3:** *"To what extent can frontline employees and customers predict firm performance?"*
    - **Paper 3 sub-question A:** *"What are the strategic issues frontline employees (call center employees) and customers can predict and identify for SIM?"*
    - **Paper 3 sub-question B:** *"What is the predictive accuracy of frontline employees compared with the predictive accuracy of customers?"*
    - **Paper 3 sub-question C:** *"What are the implications of integrating aggregated judgmental forecasting of strategic issues for SIM research and practice?"*

To answer the above research questions, the author was immersed in a large telecommunications provider in Denmark for three years (2013 – 2016) as an industrial PhD. Here the researcher was part of 5 different departments in 4 different business divisions at different points in time during the three-year period e.g., both the group strategy department as well as the strategy and business development department in a newly established business division. Hence, the researcher continuously moved between the strategic apex (corporate center) and the organizational periphery (local business divisions) during the project, similar to the transitionary swings of a pendulum. For a more detailed explication of the challenges and dynamics in this research set-up, please refer to chapter 1 (section 1.7). The research questions were addressed in three different papers, where each paper focused on a specific research question that could provide part of an answer to the general research question of the dissertation.

Paper 1 (chapter 2): This was a conceptual paper that sought to provide an answer to the first sub-question. The paper entailed both a literature review of strategic issue management, integrative/interactive strategy-making and collective wisdom – as well as theory development, by introducing various propositions based on a synthesis of rationales from the review. The paper explored and developed a theoretical rationale for how to utilize collective wisdom of frontline employees and customers in strategic issue management. The paper argues that in order to utilize collective wisdom in SIM, a balance between collective wisdom and a receptive central apex is needed. Here, collective wisdom is conditioned by the pre-requisites of ability, diversity and independence. Moreover, a receptive central apex is comprised by managers having 'the right' mindset in addition to having supportive organizational processes. In combination, these two notions should create the potential for successful utilization of collective wisdom in SIM. Paper 1 provides a cross-fertilization of the collective wisdom and strategy literatures, but the main contribution of the paper lies in introducing the notion of collective wisdom to further advance the literature on strategic issue management.

Paper 2 (chapter 3): This was a qualitative paper that explored how intended and emergent strategy processes interact over time in a particular volatile (hostile) industry context. The data consisted of semi-structured interviews, casual participant observations and archival data. The paper extended recent work on a comparable case by Mirabeau and Maguire (2014), by studying the market leader of a particularly hostile telecommunications context uncovering an alternative model of strategic emergence. The findings illustrate how highly competitive

industry conditions can create an organizational context that hinders inductive autonomous initiatives and urges central deductive actions – thus, creating an information gap between the ongoing experiences gained by lower-level employees operating in the periphery of the organization and the perceptions of key decision-makers at the central apex. This setting fostered instances of maverick behavior among certain employees, as a way of circumventing formal strategy processes. Paper 2 contributes to the strategy literature by providing an alternative model of strategic emergence.

Paper 3 (chapter 4): This was a quantitative paper that sought to measure the predictive accuracy of respectively frontline (call center) employees and customers in predicting firm performance. Paper 3 seeks to advance the literature on SIM, by arguing for the use of aggregated judgmental forecasts from the periphery. Paper 3 assessed the accuracy of more than 150,000 individual forecasts based on 13,531 survey responses from both frontline (call center) employees and customers. It is found that call center employees can predict the evolving performance in the number of incoming calls, customer satisfaction and revenue. In contrast, there is not found any significant results from the customers, albeit they are more respondents. Paper 3 implicates promising prospects for incorporating aggregated judgmental forecasts from frontline employees into SIM processes and systems.

In combination, the papers in the dissertation frame an interactive strategy-making approach for using collective wisdom of frontline employees to continuously identify emerging issues that updates top management about ongoing developments for active managerial engagement in executing adaptive initiatives. More specifically, the following findings deserve to be highlighted:

- To utilize the collective wisdom of the frontline in SIM, there needs to be a balance between collective wisdom and a receptive central apex (**paper 1**).
- The industry context may condition a setting that is not conducive to include insights from the organizational periphery (**paper 2**). Paradoxically, it may be in these very industries where it could be useful to incorporate aggregated frontline insights.

- The results suggest that aggregated judgmental forecasts of frontline employees are much more accurate than customer forecasts, which suggests that frontline employees are a useful source of information for SIM (**paper 3**).

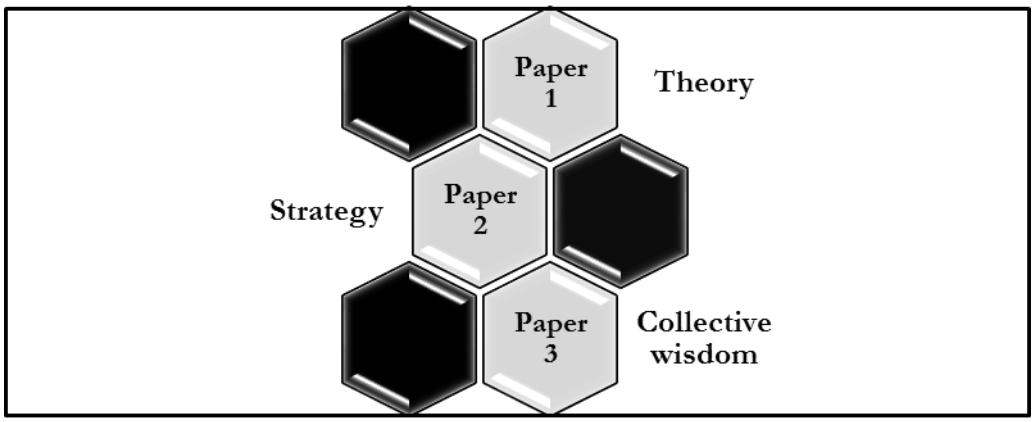
Hence, the 3 papers have in combination provided an answer to the main research question of the dissertation, as they explicate (i) the extent of the predictive accuracy of frontline employees and customers, and (ii) provide specific insights into how to utilize their collective wisdom in SIM e.g., how and what they can predict, and maintaining a balance between collective wisdom and a receptive central apex etc. As the results and findings are too abundant to fully list here, only the main contours of the various papers have been provided in the preceding section. For a more detailed explication of the various results, the reader is referred to chapters 2, 3 and 4. In continuation of this brief summary of results, the following section will build upon these insights by tying the three papers together.

5.2 Tying the three papers together

The three papers each have idiosyncratic findings that, nevertheless, can be combined to provide a more comprehensive picture of the reality described in the study. Moreover, as explicated in chapter 1 the various papers follow a progressive and complimentary structure and logic with common presumptions on strategy. For instance, paper 1 provides a conceptual argument that is needed to guide the empirical work. Paper 2 provides an understanding of the organizational processes, and explicates how context may condition a certain approach towards insights from the organizational periphery. Paper 3 illustrates that call center employees can predict various dimensions related to firm performance. The same accuracy cannot be seen with the customer respondents. Put differently, papers 1 and 3 suggest that the collective wisdom of frontline employees can be utilized in SIM. Where paper 1 provides a conceptual argument, paper 3 provides the empirical evidence in support of the argument. Paper 2 shows that a hostile industry context may foster an environment where peripheral insights are not actively utilized. Paper 3 (indirectly) suggests that the strategic processes seen in paper 2 come at a cost. Moreover, the papers are tied together by common presumptions of strategy, research context and process philosophy. Therefore, there is more than one linkage between the various papers. In continuation of this, the papers are tied together as paper 1 explicates the theoretical propositions that are partly tested in paper 3, within an organizational context described in paper

2. Moreover, paper 1 argues for a balance between strategy processes and collective wisdom, where paper 2 investigates strategy processes in the research setting, and paper 3 measures the predictive accuracy i.e., collective wisdom. A more comprehensive explication of the structure of the three papers is further detailed in chapter 1. However, the logic of the findings, resembling a jigsaw puzzle of providing a piece of knowledge to a larger picture of reality, is illustrated in figure 5.2. Here, the black cells in figure 5.2 refer to some of the new research questions that have emerged, as detailed in figure 5.1.

Figure 5.2: Assembling a jigsaw puzzle of papers.



Source: Author's own creation

5.3 Theoretical implications

The theoretical implications of the present study are apparent at both the article-level and at the dissertation-level. That is, the various articles each have distinct contributions, and when combined, the dissertation in itself makes a broader contribution. These contributions have important theoretical implications in terms of advancing and extending the literature on strategic issue management.

The study was motivated by a paradoxical position within strategic management. Here, the literature has long alluded to the notion that lower-level employees immersed in business operations should have updated experiential insights that may have strategic value (e.g., Burgelman and Grove, 1996; Mintzberg, 1987; Potter and Lipinsky, 2009) often unbeknownst to top-management (Bower and Gilbert, 2007). Yet, these insights are rarely utilized by decision makers, although they may be important resources for dynamic adaptive capabilities in high

velocity environments (Eisenhardt and Martin, 2000). Moreover, the notion of SIM has traditionally been described as a managerial process, where little empirical research has subsequently followed up on Ansoff's (1975, 1980) pioneering work. Hence, the present dissertation sought to advance research on SIM by introducing the collective wisdom of frontline employees as a core resource in anticipating emerging strategic issues.

Seen as a whole, the dissertation contributes by (i) measuring the predictive accuracy of frontline employees and customers in predicting firm performance; (ii) providing an argument for utilizing the collective wisdom of frontline (call center) employees in strategic issue management, and (iii) framing an organizational approach using collective wisdom of frontline employees to identify and update top management of emerging strategic issues. Combined, the dissertation extends and advances the literature on SIM, where not much empirical work has followed up on Ansoff's (1980) seminal article. Hence, this dissertation argues that (i) strategy literature should reconsider and extend its focus upon strategic issue management; (ii) more empirical studies should be conducted within strategic issue management – and in particular, that (iii) utilizing the collective wisdom of frontline employees is a promising prospect for the future study of strategic issue management.

Moreover, it is important to note that SIM can be perceived as a concept that, in part, is able to bridge the seminal wedge between the planning/design schools of strategy and the learning school of strategy (the reader is referred to chapter 1 for a more detailed explication of this argument). Furthermore, the dissertation seeks to create a cross-fertilization between the domains of collective wisdom and strategy, which is a predominantly unexplored territory that should provide promising prospects for future studies. Moreover, the various papers similarly make distinct contributions to the literature with important theoretical implications.

Paper 1: This paper seeks to introduce the concept of collective wisdom into SIM, which comprises an important cross-fertilization of these different domains. In addition, the paper seeks to highlight dimensions of learning as important elements of utilizing collective wisdom in SIM. For instance, emphasis is put upon the *superadditivity* of interactive learning between the corporate center and the organizational periphery (Page, 2007). Moreover, the paper argues that the collective wisdom of the periphery can be utilized for *double-loop learning* if top management has the right mindset (Argyris, 1976). Another contribution and implication,

however, is the paper's emphasis on a *balance* between collective wisdom and a receptive central apex as pivotal criteria for realizing the potential of collective wisdom in SIM. This proposition similarly extends existing research on SIM (Ansoff, 1975, 1980).

Paper 2: This study contributes by uncovering a model for strategic emergence that extends current studies and illustrates the interplays (or lack of the same) between induced and autonomous initiatives in a particular competitive setting. Moreover, the findings provide a different and novel perspective between the interplays between intended and emergent strategy, as well as the role of the environment in influencing how these elements interact over time. In continuation of this, the paper introduces the concept of maverick behavior as an important element in this interplay. Hence, the paper contributes with an extended model for strategic emergence that extends contemporary knowledge of how it can come about (as an alternative to e.g., Mirabeau and Maguire, 2014).

Paper 3: This paper provides empirical evidence that reinforces the long alluded to idea within strategy literature that lower-level employees may have insights of strategic importance (e.g., Burgelman and Grove 1996; Mintzberg, 1987; Potter and Lipinski, 2009). Put differently, the paper seeks to advance strategic issue management by measuring the predictive accuracy of frontline employees and customers in predicting firm performance, and by arguing that the collective wisdom of frontline employees can be utilized to extend and advance Ansoff's (1975, 1980) original work on SIM. The results point toward an interactive model of SIM, where the collective wisdom of frontline (call center) employees can be utilized to update top management about impending strategic issues.

Having explicated the theoretical contributions and implications of the dissertation, the following will briefly touch upon the managerial implications from the study. This section will emphasize the practical utility and potential of the findings.

5.4 Managerial implications

The present dissertation, and its composite articles, entails various findings that contribute to, and challenge, current strategy thinking in practice. The utilization of collective wisdom gathered from judgmental forecasts from frontline employees dispersed across the organization to inform the corporate center of emerging issues is a new phenomenon in practice. The study

provides evidence of the validity and relevance of the approach, and it provides both conceptual guidelines for managing such an approach (paper 1), and it explicates practical methods for carrying it out in practice (paper 3). Hence, the dissertation provides the contours and steps for an organizational approach to utilizing peripheral insights in SIM. Moreover, paper 2 suggests that these insights are currently being underutilized in contexts where this collective wisdom should be able to provide the most value i.e., in large organizations operating in volatile industries. This resonates with the arguments from the literature with respect to the utilization of updated information from within the organization and its frontline employees (Arrow, 1974; Dutton, 1993; Potter and Lipinski, 2009). Here, it is often emphasized how managers make decisions 'on automatic', and that incorporation of diverse insights is hindered by substantial information costs/information overload – as well as defensive reasoning when the dominant logic is challenged (Burgelman and Grove, 1996). In continuation of this, the dissertation shows that the environmental setting and firm heritage may foster a context where the *interactive learning* between the corporate center and organizational periphery is close to being non-existent. Hence, interactive strategy-making may constitute a unique and valuable *strategic resource* in these environmental settings. This is especially pertinent as paper 2 similarly shows that certain lower-level employees may act and react to emerging issues unbeknownst to top managers through maverick behavior *despite* having a predominantly top-down driven approach and reduced local slack. In combination, the papers point toward a practical suggestion of a more *balanced* and *interactive* approach to strategy-making in large organizations in highly competitive environments i.e., strategy-making as 'walking on two feet in order to move the organization forward', as comprehensively explicated in chapters 1 and 3.

5.5 Limitations and further research

Although the present dissertation has interesting findings and important implications, it will necessarily also entail certain limitations. Moreover, future studies can address some of these limitations and further extend the proposed approach in order to further develop the notion and test the verisimilitude of the conceptualized approach.

The findings of the project are naturally influenced by the fact that the study was conducted in a single organization. Although important insights can be drawn from single cases (Flyvbjerg, 2006; Siggelkow, 2007; Yin, 2003), the generalizability of the findings are naturally

limited. Here, the findings from paper 2 seek to make analytical generalizations, where the empirical observations are utilized to revise and relate to theory (Yin, 2003) – and paper 3 seeks to provide a 'proof-of-concept' that can be replicated in future studies. Paper 3 similarly built upon previous work by e.g., Hallin et al. (2012, 2013), and related its findings to other studies within strategic management, which provided some avenues of analytical generalizations. Despite these considerations and efforts, future research naturally necessitates that the concepts, phenomena and rationales of the present dissertation are observed, tested and followed in different settings with more variance. Here, it is likewise relevant to extend the present work to e.g., other stakeholder groups such as former employees, suppliers, trade unions, consultants, analysts, and stockholders. Moreover, the techniques and methods for collecting and analyzing the dispersed insights may similarly benefit from novel developments within IT, such as artificial intelligence/machine learning and big data. Doing so, would open up for interesting work in following-up on the effectiveness of these mechanisms in SIM, as especially the notion of big data has the potential to revolutionize management (McAfee and Brynjolfsson, 2012). The process of utilizing the collective wisdom of the frontline in SIM could similarly have been related to (i) the marketing literature on market research, and (ii) the literature on customer relationship management i.e., CRM. Albeit the author sees clear conceptual and practical value in relating the processes, concepts and findings of the present dissertation to these domains, the author sought to keep a clear focus on contributing to the strategy literature – in particular the SIM literature. However, this author strongly posits that using collective wisdom – in future studies – should be related to the marketing literature on market research, customer satisfaction, and CRM. There are important implications of utilizing this approach in marketing, as it could potentially result in getting better, more timely and accurate information about customer fulfillment compared to various market-based customer analyses. Moreover, the approach could be extended as a way of streamlining supply chains based on accurate and timely frontline forecasts in order to minimize so-called 'bullwhip effects', where demand variability may increase as one moves away from the customer/frontline employee interaction.

Furthermore, the dissertation has not explicitly dealt with the related 'costs' of incorporating frontline insights in detail. Albeit the actual monetary costs of incorporating frontline insights are arguably rather low (although there are direct costs related to information aggregation and opportunity costs of employees spending time on providing insights), the

cognitive information costs entailed in doing so may be substantial suggesting that it does take a certain kind of leadership approach to be able to utilize it in practice (e.g., being capable of having diverse points of view, being open-minded, valuing diversity). Furthermore, maintaining the needed flexibility that SIM requires does come at a cost as well; for instance, slack resources are often required to create timely adaptive responses, and there may be cultural and cognitive barriers related to modifying a pre-defined strategy within an organization.

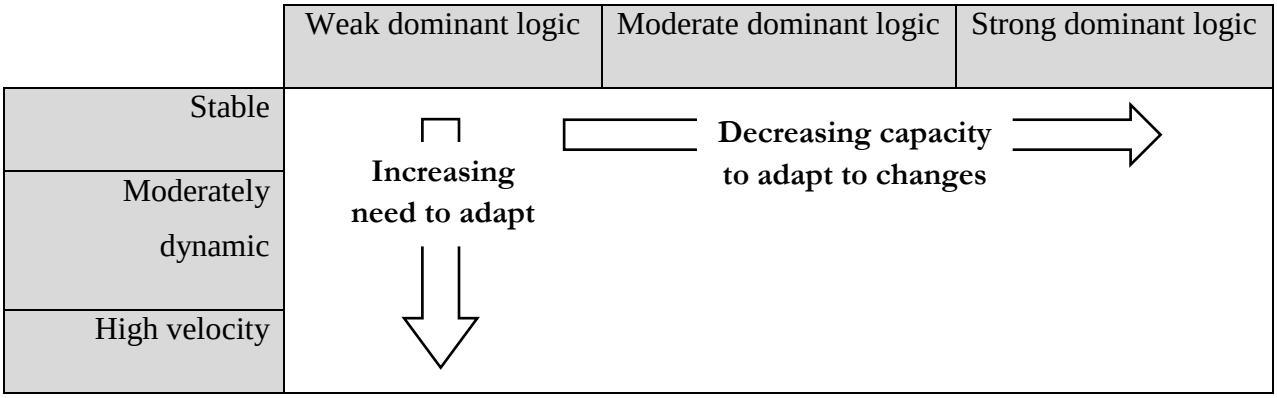
Furthermore, some of the novel questions that directly emerge from the findings of the dissertation are as follows: (i) The predictive accuracy seen among the frontline employees could not be seen among the customer respondents in the study. Hence, it is relevant to test if this is a general pattern and if so, why this is the case. It could be envisioned that this is an industry-specific effect, but further work needs to be done in this area. There is currently little attention to and discussion about how such industry-specific effects might arise, and why they exist. (ii) Paper 3 provided evidence for the predictive capabilities among frontline employees, but paper 2 suggests that in environments where this insight is needed, the environment itself may condition an organizational setting where this insight is not utilized. Hence, future studies may want to look into how this paradox can be overcome. (iii) Future studies may similarly investigate if certain individuals among the frontline group are consistently better forecasters, and if so – why? This latter question is relevant and interesting as it would provide a more intricate understanding of the microfoundations of collective wisdom. Moreover, it would be practically valuable, as it would potentially limit the amount of individuals to ask of emerging developments, by understanding where and how individual forecasters outperform the others.

One of the important aspects in the findings of paper 2 was the apparent disconnect between, on the one hand, the 'heritage' and 'dominant logic' of the organization – and on the other hand, the turbulent and evolving dynamics of the environment. This is an aspect which has similarly been seen in other studies of strategy in technology companies facing *strategic inflection points* (Burgelman and Grove, 1996). Consequently, one potential research agenda may entail how (i) contextual conditions may affect strategy processes, and (ii) how heritage and dominant logics may simultaneously influence strategy processes under these various contextual conditions. This research agenda may point towards contingent domains where it is particularly essential that the frontline employees' collective wisdom is utilized to update a dominant logic

among management that is becoming obsolete (i.e., high velocity environment with a strong dominant logic among the key decision makers, as seen in table 5.1). This phenomenon has similarly been referred to as *the Icarius paradox* (Miller, 1992) or *firm disruption* (Christensen, Anthony and Roth, 2004), where management is too focused on existing competencies instead of anticipating the competitive competencies needed in the future (Andersen, 2013). This can be particularly dangerous in highly volatile environments where the competencies, on which the actors compete to build or sustain a market positioning, can suddenly shift and become obsolete.

One illustration of this may be the case of Nokia, which went from being a dominant player within mobile phones to being disrupted by other market actors such as Apple. Here, employees within Nokia could be expected to have known of the threat before (or while) it happened – and would have been able to warn against the threat in a timely fashion. It has also been documented how key decision makers within the firm were negligent of the impending threat. Hence, managers were overconfident in their own preconceived forecasts of market developments and competitive dynamics.

Table 5.1: Environment type versus dominant logic.

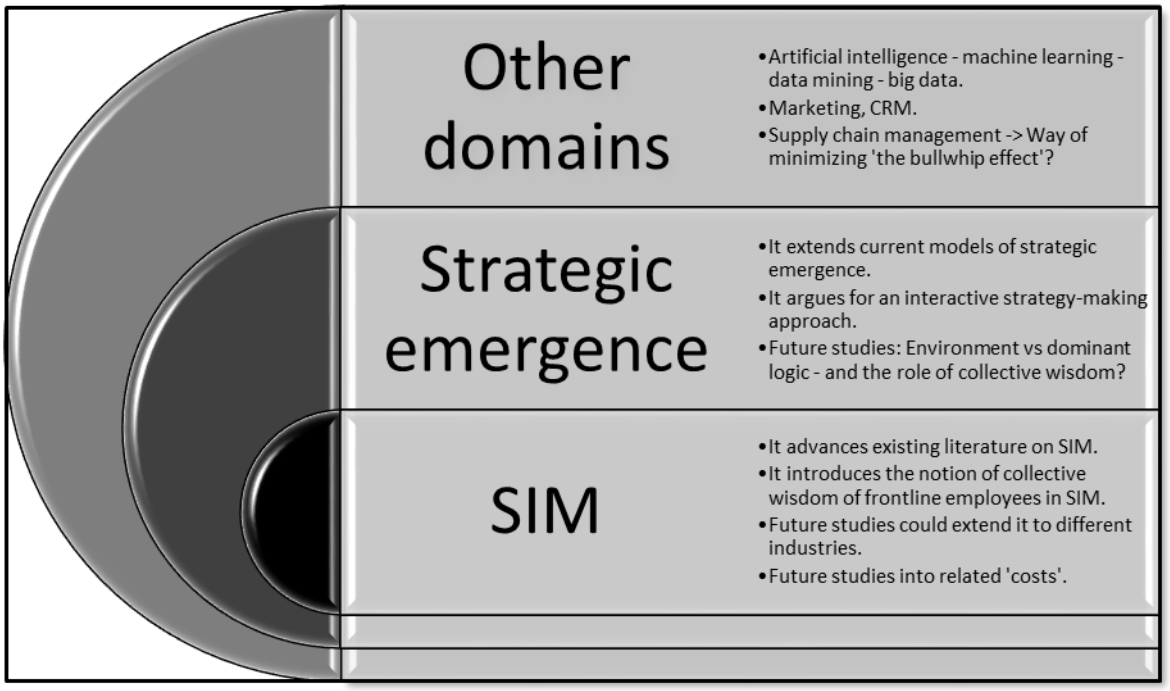


Source: Author's own creation

Figure 5.3 summarizes the previously discussed domains where the present dissertation has contributed – and the domains where the present dissertation could potentially be extended to. Here the core contributions pertain to SIM and strategic emergence, but future studies could similarly explore the same notions in relation to e.g., marketing/CRM, supply chain management/bullwhip effects and artificial intelligence/machine learning.

Moreover, the related costs of the approach could be further investigated in future studies, where ‘costs’ can be either direct, indirect or be utilized figuratively such as ‘information costs’ to denote cognitive barriers and information overload.

Figure 5.3: Where does the present dissertation contribute – and where can it be extended to?



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These avenues constitute fruitful trajectories for future research that has been inspired by, and resulted from, the basic work conducted in the present study. It is the hope of the author that *collectively* these efforts will provide enhanced *wisdom* i.e., the *collective wisdom* of various research communities. As it has been explicated in the present dissertation, collective wisdom is a result of the ability and diversity of its individual group members. Hence, future research should similarly adhere to these key principles, inviting contributions from diverse and knowledgable disciplines.

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