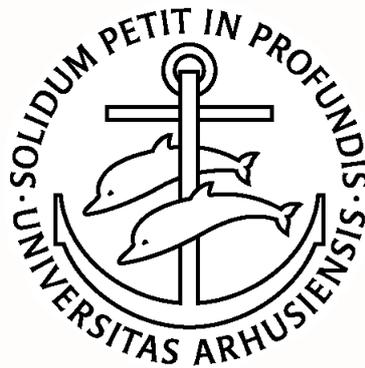


# **The Role of Idea Management Systems for Innovation in Large Organizations: 3 essays**

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*Michela Beretta*

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## **Executive Summary**

Scholars have long argued that the fuzzy front-end of innovation, during which ideas are generated, matured and then evaluated and selected for further implementation, is vital for the innovative performance of organizations (Khurana and Rosenthal 1998; Reid and de Brentani 2004). Ideas represent the basis of any innovation effort (Bjoerk, Boccardelli et al. 2010). Consequently, generating a continuous inflow of ideas to nurture is crucial in order to successfully innovate and remain competitive (Boeddrich 2004). During the recent decade various technologies and tools have been introduced to support the generation, collection, maturation and selection of innovative ideas. A salient example is represented by the diffusion of crowdsourcing platforms to capture ideas from external contributors (Leimeister et al. 2009; Bayus 2013; Dahlander and Piezunka 2014). At the same time, large organizations increasingly implement web-enabled idea management systems (IMS) internally to involve the diverse and distributed crowd of employees in innovation (Kijkuit and Van den Ende 2010; van den Ende et al. 2014).

However, while current research emphasizes the benefits of external sources of innovation to access variety of inputs, little attention is placed on the potential search opportunities for new ideas and solutions residing within the organizational boundaries. This PhD thesis contributes to current innovation management research by suggesting that large organizations may benefit from performing a broader search for ideas and solutions within their boundaries by accessing the internal crowd of distributed employees. Arguably, the increasing implementation and use of web-enabled IMS at the front-end of innovation may enable large organizations to access and exploit the broader diversity of knowledge and competences of employees working in different geographic locations, functions or hierarchical levels, thus fostering employee-driven innovation in new ways. As such, these new technologies may

enable large organizations to expand their intra-organizational search efforts for ideas and solutions by spanning various internal boundaries.

Based on three essays, this PhD thesis aims to shed more light on the important phenomenon of IMS for innovation. More specifically, I address the question of how the use of IMS in large organizations contributes to shape and support the process of search, generation, development and selection of employees' ideas. In order to do so, I employ both qualitative and quantitative methods based on data collected from six large organizations in Denmark and Sweden. The three essays part of this thesis investigate the role of IMS for innovation from different perspectives. The first essay focuses on why and how managers choose to develop and implement internal IMS for innovation in different ways. By drawing on a qualitative multiple-case study of five large organizations in Denmark, this study explores managers' interpretations, assumptions and expectations toward implementing IMS and how these shape subsequent actions toward them. While current studies hint that the implementation of IMS is mainly related to organizations' need to generate innovation, this study identifies two alternative explanations for why and how managers implement them: legitimacy-seeking and goal-orientation. These findings may challenge more functionalistic explanations for organizing innovation offered by current research. The second essay investigates how the early phases of the innovation process are moderated and managed through the use of web-enabled IMS. Based on a qualitative case study of a large organization headquartered in Sweden, this study provides a more detailed understanding of the role played by an emerging set of actors - often labeled as 'moderators' of IMS - who assume the informal role of facilitating employees' ideation efforts. The findings of this essay highlight key interventions conducted by moderators to organize and manage the front-end of innovation in distributed manners through the use of IMS. Moreover, they identify key tensions emerging when moderating ideation and the balancing management act required.

Finally, the third essay examines which factors affect the selection of ideas in online ideation platforms. First, it examines how different types of contributors' knowledge diversity may help mature submitted ideas better for selection. Second, it suggests that idea selection also depends on the characteristics of the idea, both in terms of its type (process vs. product) and its formulation. Based on a rich and extensive dataset of 726 ideas and 2925 comments submitted to an online ideation platform of a large Danish firm over the course of 16 months, I employ a probit model to examine the effect of these factors on the likelihood of an idea being selected. The findings show that both the characteristics of an idea and the diversity brought by contributors to it (especially in terms of functional knowledge domains and expertise) affect its success chances.

Overall, the findings of this thesis are important to further advance innovation management research and, more generally, organizational research. Taken together, these findings shed more light on the key processes, roles, decisions as well as human and social capital arguments that underpin the use of IMS at the front-end of innovation. The thesis concludes by summarizing the key theoretical contributions and managerial recommendations of the three essays and by outlining avenues for further research on IMS for innovation.



## Resume

I innovationsforskningen har man længe diskuteret vigtigheden af den spæde begyndelse i innovationsprocessen – der hvor ideer opstår, modnes, evalueres og udvælges til implementering (Khurana og Rosenthal 1998; Reid og de Brentani 2004). Ideer er starten på al innovation (Bjoerk, Boccardelli et al. 2010). For at sikre at en innovation bliver en succes og for at sikre fortsat konkurrencedygtighed er det derfor altafgørende med en konstant strøm af ideer (Boeddrich 2004). Gennem det seneste årti er der blevet udviklet en række innovationsledelsesteknologier og – værktøjer til at understøtte udvikling, indsamling, modning og udvælgelse af innovative ideer. Et markant eksempel er udbredelsen af crowdsourcing-platforme, som anvendes til at indhente ideer fra eksterne aktører (Leimeister et al. 2009; Bayus 2013; Dahlander and Piezunka 2014). I et forsøg på at sætte skub i innovationsprocessen implementerer store virksomheder i stigende omfang interne web-baserede idestyringssystemer (IMS) med det formål at engagere forskellige og geografisk spredte medarbejdergrupper (Kijkuit and Van den Ende 2010; van den Ende et al. 2014).

Mens den aktuelle forskning peger på vigtigheden af at have adgang til eksterne kilder i forbindelse med innovation, er der kun lidt fokus på potentialet i at fremsøge nye ideer og løsninger internt i virksomheden. Dette ph.d.-projekts bidrag til ny innovationsledelsesforskning er påstanden om, at store virksomheders adgang til medarbejdere ved hjælp af web-baserede innovationsteknologier kan understøtte dens søgen efter ideer og løsninger internt. Man kan hævde, at IMS i innovations processens spæde start søger at få adgang til og udnytte den omfattende viden og de forskellige kompetencer, som medarbejdere, der arbejder på forskellige lokaliteter, i forskellige funktioner og på forskellige niveauer, har, for på denne måde at skabe en ny form for medarbejder-drevet innovation. Ved at opløse interne skel gør de nye teknologier det muligt for virksomheder at udvide deres søgen efter nye ideer og løsninger inden for virksomhedens rammer.

På baggrund af tre artikler søger denne afhandling at belyse det vigtige i idestyringssystemer (IMS) i forbindelse med innovation. Især ønsker afhandlingen at give en mere detaljeret forståelse af, hvordan innovation igangsættes, organiseres og styres ved hjælp af disse systemer. Projektet anvender her både kvalitative og kvantitative metoder til analyse af data fra seks store virksomheder i Danmark og Sverige. De tre artikler undersøger fra flere perspektiver, hvilken rolle IMS spiller for innovation. Den første artikel fokuserer på, hvorfor og hvordan ledere vælger at udvikle og implementere interne IMS til innovation. Ved at trække på et kvalitativt studie med fem store virksomheder i Danmark undersøger dette studie lederes fortolkninger, antagelser og forventninger i forhold til implementering af IMS, og hvad dette betyder for systemernes design. Hvor nyere studier antyder, at implementering af IMS i hovedsagen er et resultat af virksomheders behov for innovation, som for eksempel nye produkter, processer og servicetilbud, identificerer vi to alternative forklaringer på, hvorfor og hvordan ledere implementerer disse nye innovations-understøttende teknologier: legitimitetssøgning og målretning. Vi mener, at vores resultater anfægter den nyere forsknings mere funktionalistiske forklaringer på, hvordan innovation organiseres. Den næste artikel belyser, hvordan startfasen i en innovationsproces skæres til og styres ved hjælp af de web-baserede ideudviklingssystemer. Studiet baserer sig på et kvalitativt case-studie af en stor virksomhed med hovedsæde i Sverige, og det giver en dyb forståelse af de nye aktører – ofte benævnt IMS - moderatorer – og den uformelle rolle de har i facilitering af medarbejdernes ideudviklingsindsats. Endelig handler den tredje artikel om, hvilke faktorer der har betydning for udvælgelsen af ideer. Først undersøger jeg, hvordan den forskellige viden, som aktører bringer i spil i forbindelse med ideforslag, kan fremme idemodningen hen mod et valg. For det andet argumenterer jeg for, at ideudvælgelsen også afhænger af ideens egenskaber, både hvad angår type (proces eller produkt) og dens udformning. På baggrund af et stort datasæt bestående af 726 ideer og 2925 kommentarer afgivet på en online-ideplatform i en stor dansk

virksomhed over en periode på 16 måneder, bruger jeg en probit-model til at undersøge effekten af disse faktorer på sandsynligheden for, at en ide bliver udvalgt. Jeg fandt belæg for min formodning, at både selve ideens karakteristika og den mangfoldighed, som bidragyderne kommer med i den første modningsproces, har betydning for en ides chance for succes.

Generelt set er resultaterne fra disse artikler vigtige for den videre udvikling af forskningen inden for innovationsledelse, og mere overordnet, for organisationsforskningen. Samlet set belyser disse resultater processerne, rollerne, beslutningerne og human-kapital og social-kapital argumentationen, der understøtter brugen af IMS i innovationsprocessens spæde start. Afhandlingen rundes af med en opsummering af hovedbidragene og ledelsesanbefalingerne fra de tre artikler samt udstikker kursen for den fremtidige forskning i IMS i forbindelse med innovation.



## **Introduction**

With the increasing diffusion and implementation of open innovation activities organizations recognize the importance of more dynamic and permeable boundaries (Lakhani et al. 2012). This enables a wider and more diverse set of internal and external individuals to contribute to the innovation process (Chesbrough 2003). Accessing diversity is particularly important during the initial phases of innovation, often referred to as the fuzzy front-end of innovation, where ideas are generated and further developed (Kijkuit and Van den Ende 2010; Deichmann and van den Ende 2014). Whereas much innovation literature focuses on how organizations can benefit from external sources of innovation, less attention is placed on the opportunities to expand the search for ideas and solutions within the organizational boundaries by involving the internal crowd of distributed employees. This becomes especially relevant in the case of large organizations “with many employees in different locations performing different but related tasks” (Afuah and Tucci 2012, p. 365). Thus, a large number of employees widely distributed in terms of geographic locations, functions or hierarchical levels may serve as a lever for creating diverse inputs to the initial innovation process (Neyer et al. 2009). This view has led to an increasing adoption and implementation within organizations of new systems and tools to support and feed the innovation process. In particular, increasing attention is placed on the diffusion of dedicated web-enabled systems - commonly labeled as ‘idea management systems’ - supporting the collection, generation, development and evaluation of ideas coming from the internal crowd of employees (Van Dijk and Van den Ende 2002; Bjelland and Wood 2008; Sandstrom and Bjork 2010; Birkinshaw et al. 2011; van den Ende et al. 2014).

This thesis aims to shed more light on the important phenomenon of idea management systems (IMS) for innovation. By doing so, it aims to contribute to the innovation management literature and, more specifically, to the research streams of the front-end of

innovation and innovation search processes. In this introduction I further elaborate on these arguments to explain why IMS constitute an important phenomenon requiring further investigation and to identify related gaps in existing literature. More precisely, I posit that understanding how the diffusion of new technologies for innovation such as IMS contributes to change the way the early phases of the innovation process are organized and managed in large organizations is crucial in order to further progress innovation management research and, more generally, the domain of organizational research.

### **1.1. Firm-Level Innovation Search Processes**

In general, innovation can be defined as a process that entails the generation of an idea, its further development and its implementation (Van de Ven 1986; Garud et al. 2013). This relates to a view of innovation that alternates between variation, selection and retention (Garud et al. 2013). Such a perspective indicates that ideas<sup>1</sup> constitute the basis of innovation (Bjork et al. 2010) and that organizations need to have a continuous inflow of ideas to feed the innovation process (Boeddrich 2004; Brennan and Dooley 2005). Scholars highlight the importance of search activities to access new inputs and ideas for innovation (Nelson and Winter 1982; Laursen and Salter 2006). Various studies have investigated how organizations perform and organize the search for innovative ideas and solutions for new processes, products and services by focusing on two types of search, local and distant search (Katila and Ahuja 2002). Local search is defined as “knowledge residing in the neighborhood of the organization’s current knowledge base” (Laursen 2012, p. 1184), while distant search entails an “effort to move away from current organizational routines and knowledge bases” (Katila and Ahuja 2002, p. 1184). Previous studies claim that local search represents the predominant approach used by organizations, as they tend to rely on their previous experiences, accumulated knowledge and competences when searching for new inputs (Dosi 1982; Nelson

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<sup>1</sup> As stated by van den Ende et al. (2014, p. 1), “Ideas are the result of mental activity and are formulated verbally so that they can be represented, shared, and refined”. Therefore, ideas represent the basis of innovation.

and Winter 1982). As pointed out by Laursen (2012), this tendency to search locally may be related to three main reasons. First, managers possess limited cognitive and attention capabilities (Ocasio 1997), which restrain the amount of alternatives they can consider and assess (Knudsen and Levinthal 2007; Laursen 2012). Second, it is easier for organizations to search for new ideas in domains that are already familiar and in which they have accumulated expertise and knowledge (Cohen and Levinthal 1990). Third, this type of search is often considered reliable and less expensive to conduct and, thus, more efficient (Stuart and Podolny 1996; Laursen 2012).

However, it is not clear whether local search is always beneficial for organizations (Laursen 2012). Current studies, in fact, emphasize the downsides of this type of search, highlighting the importance of performing a more distant search for ideas and solutions (Levinthal and March 1993; Tripsas and Gavetti 2000; Jeppesen and Lakhani 2010; Afuah and Tucci 2012). This body of literature highlights how local search may also lead to downsides such as lock-in, solution myopia and path dependency. This may then limit the diversity and novelty of ideas and solutions which organizations can access (March 1991; Poetz and Schreier 2012), an aspect which is considered essential for innovation and problem solving (Rosenkopf and Nerkar 2001; Laursen 2012). As a consequence, organizations may need to expand their search efforts beyond their organizational boundaries to access a diverse set of actors and potential sources of innovation, in this way mitigating “the local search trap” (Von Hippel 1995; Chesbrough 2003; Laursen and Salter 2006; Jeppesen and Lakhani 2010; Laursen 2012). This is also based on the insight that knowledge is widely distributed among dispersed individuals and organizations (Hayek 1945; Von Hippel 2005). Thus, a more distant search in terms of external sources of innovation such as competitors, customers and suppliers may be beneficial to access diversity of inputs. However, it is also argued that too much distant search may be detrimental considering the associated costs (Laursen and Salter 2006). At the

same time, it raises challenges for organizations in terms of appropriability – i.e. how to protect essential knowledge when searching externally (Laursen 2012). As such, “there seems to be an inherent trade-off between the advantages to be gained from variety and the degree of variety that firms can manage effectively” (Laursen 2012, p. 1182).

Hence, when considering the debate about local and distant search, it is not clear where the benefits stand in those two extremes. A key question is how organizations can balance local and distant search efforts to benefit from both approaches (Laursen 2012). Besides, whereas recent research emphasizes the downsides of local search and the importance of performing more distant search to access variety, little attention is placed on the potential search opportunities for a broader diversity of knowledge and ideas residing within the organizational boundaries. Organizations can be regarded as knowledge distributed systems (Tsoukas 1996) and thereby there may be opportunities to access a wider diversity in terms of distributed employees. Arguably, this is especially relevant in the case of large-sized organizations as they have the potential to expand their search efforts across various internal boundaries. Similarly, Rosenkopf and Nerkar (2001) state that large organizations can benefit from searching within their boundaries: “Internal boundary-spanning exploration integrates technologically distant knowledge residing within the firm” (Rosenkopf and Nerkar 2001, p. 290). Thus, large organizations may be able to access more distant knowledge residing internally. At the same time, large organizations can search across different geographical boundaries to access the knowledge of their subsidiaries (Frost 2001) and thus expand the variety of inputs for innovation (Katila and Ahuja 2002). In the same line, it is claimed that organizations can also employ individuals with different skills to access diversity (Laursen 2012). Diversity of employees in terms of knowledge, competences and expertise may enable organizations to expand their search efforts and knowledge bases and thus increase their learning opportunities (Ostergaard et al. 2011). Accessing this diversity is thus beneficial

because it may provide opportunities for novel linkages (Cohen and Levinthal 1990) as well as facilitate problem solving and idea generation (Bjork and Magnusson 2009).

This PhD thesis contributes to this current debate about firm-level innovation search processes by arguing that large organizations may benefit from expanding their local search efforts for innovation internally by spanning their various functional, hierarchical and spatial boundaries. I suggest that there may be sufficient variety among widely distributed employees to provide opportunities for innovation and problem solving activities. This becomes particularly relevant considering the increasing diffusion of new web-enabled tools and technologies for innovation such as IMS. These tools enable organizations to more broadly search for ideas and solutions internally across a variety of boundaries and levels. As such, they allow access to widely distributed and diverse perspectives, problem solving capabilities and knowledge possessed by the internal crowd of employees. Performing this type of search may then be beneficial for large organizations if there is enough heterogeneity to be accessed across boundaries by using these internal web-enabled technologies for innovation. Similarly, recent studies highlight the potentialities of using online tools such as crowdsourcing platforms - where problems are broadcasted to an external crowd - to access the internal crowd of distributed employees and tap into their collective knowledge (Stieger et al. 2012). As stated by Lakhani (2006), "Given a large enough organization, there may be sufficient diversity of intellectual interests and abilities that broadcasting within the bounds of the organization may prove to be fruitful" (Lakhani 2006, p. 78). Hence, it can be argued that there may be opportunities to expand innovation search efforts not only outward - toward the external environment - but also within the organizational boundaries by involving employees across the whole organization in innovation (Neyer et al. 2009; van den Ende et al. 2014).

## **1.2. Idea Management Systems for Innovation**

Recent advances in information technology have led to the diffusion of more sophisticated web-enabled tools and systems to support organizations in their broader internal search for ideas and solutions (Sandstrom and Bjork 2010). Large organizations increasingly implement IMS with the aim of fully accessing the knowledge and creativity of their internal employees and thus of collecting and maturing as many innovative ideas as possible (Bjork et al. 2010). Cisco, for instance, has recently implemented the internal IMS “Integrated Workforce Experience”, where all employees have the opportunity to share and discuss ideas (Wilson et al. 2011). IMS can be regarded as “formalized methods of capturing, examining, nurturing and developing ideas created within an organization” (Nilsson et al. 2002, p. 500). These systems differ from traditional suggestion schemes due to their increasingly interactive and open character, thereby opening up new possibilities for employee-driven innovation and intra-organizational search. On the one hand, organizations have the possibility to expand their internal search for new ideas and solutions by potentially tapping into the broader collective intelligence of their distributed employees. On the other hand, these systems enable more collaborative approaches to innovation as employees are provided not only with the possibility to generate new ideas, but also to virtually interact and collaborate among each other to further mature and develop them (Deichmann and van den Ende 2014). Hence, for these reasons exploring this emerging phenomenon is relevant. Their increasingly open and interactive nature may transform the dynamics of search within organizations by expanding the possibilities to access the collective intelligence of distributed individuals and communities.

## **2. Research Question, Motivation and Design**

Building on the arguments presented in the previous section, the reasons for undertaking this research can be summarized in three overall points. First, while current innovation studies

mainly focus on external sources of innovation, ‘peripheral inside innovators’ in terms of employees working outside the R&D department are often disregarded (Neyer et al. 2009). Although many organizations have opened up their boundaries to the external environment, the substantial opportunities for internal ideation have not been fully investigated (Bjork et al. 2010). Second, while we observe an increasing diffusion of various online technologies and tools to access a larger and more diverse crowd of contributors, little understanding remains about the role of IMS for innovation in large organizations. In particular, it is argued that IMS may provide opportunities to support and organize the initial phases of innovation or fuzzy front-end (Kijkuit and Van den Ende 2010; Sandstrom and Bjork 2010). The front-end of innovation is the process during which ideas are generated and further developed, ending with the decision to either select or reject them (Khurana and Rosenthal 1998). However, little is known about how organizations implement and utilize these new technologies to support, organize and manage these early phases of the innovation process. This is especially crucial considering that the front-end of innovation is often depicted as an uncertain and ambiguous phase of the innovation process (Kijkuit and van den Ende 2010). As such, it requires organizations to properly manage it to avoid negative consequences on their innovative performance (Kim and Wilemon 2002; van den Ende et al. 2014). While previous innovation studies have developed important insights on the front-end of innovation (Khurana and Rosenthal 1998; Reid and de Brentani 2004; Cooper 2008), it is claimed that the diffusion of new technologies such as IMS may question them (Boeddrich 2004; van den Ende et al. 2014). As such, these systems may change the way the early phases of the innovation process are organized and performed in large organizations, requiring new mechanisms and practices. Hence, this calls for a better understanding of how the front-end of innovation is shaped, organized and managed through the use of web-enabled IMS. More specifically, this entails further investigation of key processes such as search, generation,

maturation and selection of ideas and how they are managed through the use of IMS. Third, research in the organizational field emphasizes the importance of considering the interlinkages between new technologies and organizational features, as these may have key implications for organizing innovation (Zammuto et al. 2007). Relatedly, it is claimed that accessing and exploiting the knowledge of distributed individuals require organizations to adopt new supporting practices for innovation (Foss et al. 2011). This entails, for instance, “the use of new organizational practices such as intensive vertical and lateral communication, rewarding employees for sharing and acquiring knowledge, and high levels of delegation of decision rights” (Foss et al. 2011, p. 980). Arguably, such considerations become crucial when using IMS for innovation internally. Addressing key issues such as how to encourage employees to share and mature ideas, how to reward them for their contributions, how to develop mechanisms for the evaluation and selection of submitted ideas, and how to organize the search for ideas across internal boundaries becomes salient. IMS may then require the adoption of new practices that enable to delegate decision-making among employees, foster collaboration across boundaries and provide incentives for motivation in the context of innovation. By favoring cross-functional, IT-enabled innovation these systems may then constitute a novel approach to link technology and organization together toward “new forms of organizing” for innovation (Zammuto et al. 2007, p. 749). Finally, a better understanding of these aspects is crucial not only from a theoretical point of view, but also from a managerial one. As managers increasingly implement IMS within their organizations, they face various challenges in relation to how to effectively design and employ these systems to support innovation activities, how to establish roles for their maintenance as well as how to integrate them with the organizational context.

The aim of this PhD thesis is therefore to:

*“Enhance our understanding of how the front-end of innovation in large organizations is supported, organized and managed through the use of idea management systems for innovation”.*

In order to fulfill this research aim, I address the following general research question:

***“How does the use of idea management systems in large organizations contribute to shape and support the process of search, generation, maturation and selection of employees’ ideas?”***

Thus, the general research question aims at providing a better understanding about the role of IMS for innovation in large organizations. As highlighted in the research question, the focus of this thesis is the use of IMS in *large organizations*. I build on the definition of large organization as “an organization that operates in two or more countries with multiple subunits linked through shared policies or strategy” (Kostova and Zaheer 1999, p. 65). Arguably, organizations with a large enough size may benefit from performing a broader internal search for new ideas and solutions. Thus, the size of an organization plays a key role as a contingency factor in performing this type of search, due to the opportunities to span internal boundaries and to benefit from engaging widely distributed and diverse employees in innovation activities.

Moreover, as suggested by the research question, this thesis focuses on understanding both the *process* of the front-end of innovation and the *outcome* of such process (i.e. the selection of ideas). This is because of the tendency of current innovation studies to mainly focus on the outcome of IMS in terms of quality and quantity of the ideas generated or implemented, while disregarding the process through which the front-end of innovation is organized, supported and managed (Frese et al. 1999; Bjork and Magnusson 2009; Bjork et al. 2011). Besides, my motivation to focus on understanding also the process rather than only the

outcome relates to a current discussion in the innovation management literature. While innovation is often analyzed as an outcome, more recent studies emphasize the importance of understanding the innovation processes, their development and their inherent complexities (Garud et al. 2013). These processes relate to the emergence, development and implementation of ideas (Garud et al. 2013). It is claimed that, by unfolding these innovation processes, it is then possible to focus on the various activities, decisions, roles and mechanisms underpinning the various phases (Mumford 2011). Relatedly, this thesis aims to unfold the early phases of the innovation process and, more specifically, how they are shaped and supported by the use of IMS in large organizations by focusing on three different aspects: (1) the antecedents of IMS emergence (first essay); (2) the emergence of new, informal roles for moderating ideation (second essay); and (3) the maturation and selection of ideas (third essay). By doing so, I focus on exploring to what extent and how large organizations implement and use IMS to: 1) expand and organize the intra-organizational search for ideas and solutions; 2) foster and sustain the generation of ideas from distributed employees; 3) develop and mature submitted ideas; and (4) develop mechanisms for their subsequent evaluation and selection. I posit that a better understanding of these processes may also provide valuable insights into the outcome and performances of these systems. This is especially relevant considering the existence of important differences in the levels of success and performances of IMS (Birkinshaw et al. 2011). In fact, recent studies emphasize how the implementation and use of these new technologies for innovation often fail, mainly due to their inability to drive innovation, engage employees or handle submitted ideas (Van Dijk and Van den Ende 2002; Fairbank et al. 2003; Birkinshaw et al. 2011).

Overall, the general research question of this thesis is important to the innovation management literature, especially considering the debate about why and how organizations should access and manage ideas coming from internal and external sources of innovation. It

is also essential to unfold the front-end of innovation process - and thus the key activities, mechanisms, decisions and roles underpinning it - to better understand how it is shaped by the diffusion of IMS for innovation. Besides, the increasing popularity and widespread use of IMS in large organizations makes it an important phenomenon requiring further investigation.

## **2.1. Introduction to the Three Essays of the Thesis**

In order to operationalize and narrow the scope of the research, I formulated a subset of specific research questions, each of which guides the three essays of the thesis. These specific research questions are all related to the exploration of the role of IMS for innovation in large organizations from different perspectives. In the three essays I focus on a few selected aspects of interest which have been quite neglected by current studies, but whose understanding results salient for further progressing innovation management research. How managers think about designing and implementing IMS and why they decide to employ them, how the early phases of the innovation process are moderated and managed internally by emerging roles responsible for facilitating ideation on IMS, and how specific idea-level and contributor-level characteristics affect the selection of ideas are, for instance, aspects which have not been addressed in previous studies. Besides, addressing these different aspects is essential because the ‘success’ of IMS does not depend on the characteristics of the system itself, but it is rather influenced by “how managers think about, use and experience these systems” for innovation (Deichmann 2012, p.19). Table 1 below reports the title and research question of each of the three essays. I provide a more detailed description of the content of these essays and their contributions at the end of this introduction.

**Table 1. Essay Titles and Research Questions**

<b>Essay Titles</b>	<b>Research Questions</b>
Essay 1: “Emergence and Implementation of Idea Management Systems: Legitimacy-Seeking and Goal-Oriented of Managers”	RQ1: “How does the strategic thinking and emergence of an idea management system in large organizations impact on its development and implementation?”
Essay 2: “Moderating Ideation in Web-Enabled Ideation Systems”	RQ2: “How is the ideation process moderated and managed in web-enabled ideation systems?”
Essay 3: “Why Do Ideas Get Selected? Idea Selection in an Online Ideation Platform”	RQ3: “How do the heterogeneity of contributors to an idea and the characteristics of the idea itself affect an organization’s decision to select it for funding?”

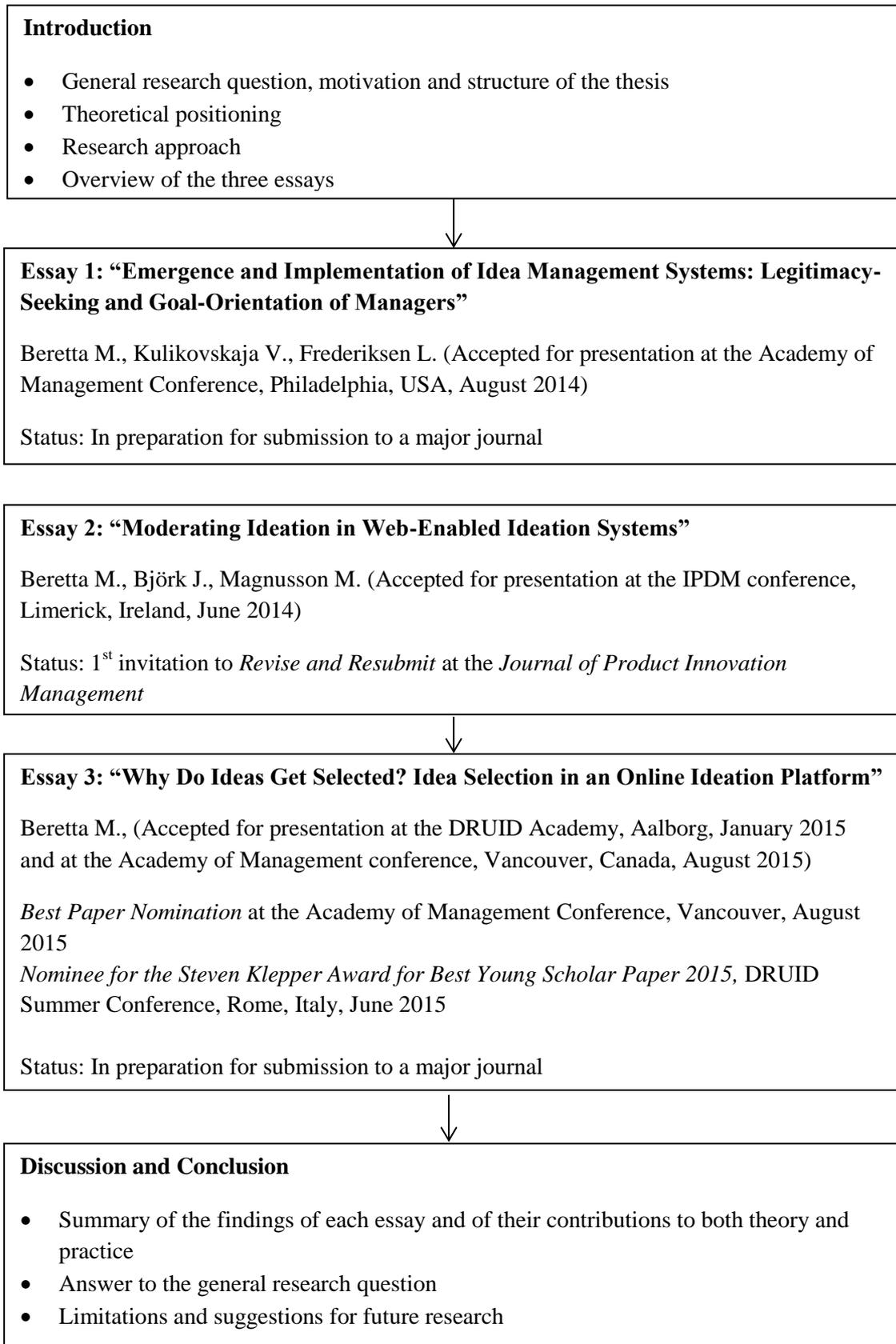
The first essay investigates why and how managers in large organizations choose to design, develop and implement IMS for innovation in different ways. Based on a qualitative multiple-case study of five large organizations in Denmark, this essay focuses on the antecedents of IMS emergence and, more specifically, investigates managers’ strategic thinking for innovation. It explores managers’ motivations, interpretations, assumptions and expectations toward implementing IMS and how these shape subsequent actions toward them. In order to address the general research question of the thesis, I argue that it is important to first understand the drivers behind IMS emergence. While these drivers are often overlooked by current research, they may have important consequences on how these systems are developed and implemented and, in the extension, on how they are used at the front-end of innovation. The second essay explores how the early phases of the innovation process are moderated and managed when an idea management system is already implemented and operationalized within an organization. More precisely, this study aims to provide a more detailed understanding of the role played by an emerging set of actors, often labeled as ‘moderators’ of IMS, who assume the informal role of facilitating employees’ ideation

efforts. This study is based on a qualitative case study of a large organization headquartered in Sweden. Finally, the third essay zooms in on a specific phase of the innovation process and investigates which factors affect the selection of ideas. More precisely, based on data collected from an internal online ideation platform implemented in a large Danish organization, this study examines how both the heterogeneity of contributors participating to an idea and the characteristics of an idea affect organization's selection decision. Hence, while the first two essays focus on unfolding processes, decisions and roles related to the use of IMS at the front-end of innovation, the third essay focuses on explaining its outcome in terms of the selection of ideas.

### **3. Structure and Content of the Thesis**

I structured the rest of this thesis as follows. First, I outline a brief literature review to specify the three research questions guiding the three essays and the research gaps they address. Second, I briefly introduce the research approach used in this thesis as well as I provide an overview of the essays and their contributions to literature. Third, I separately present the three essays of the thesis. Fourth, I summarize and discuss the contributions of the three essays to existing research and managerial practice. Fifth, I provide an answer to the general research question of the thesis. Finally, I discuss limitations and opportunities for further research and outline the conclusions of this thesis. Figure 1 illustrates the overall structure and content of the thesis. It also provides information about the authorship of the essays and their status regarding publication.

**Figure 1. The Structure and Content of the Thesis**



## 4. Theoretical Positioning

I included the following review in the introduction in order to position the research on IMS in a theoretical field as well as to discuss and define concepts which are used in the three essays. Moreover, it aims to identify and discuss existing gaps in the innovation management literature which constitute the basis for developing the three essays of the thesis. Because this literature is highly diverse, the review does not attempt to be comprehensive. Rather, I attempt to identify research gaps with respect to the use of IMS to support, organize and manage the early phases of the innovation process on which this thesis focuses. Besides, the aspects discussed in this review have important implications for managers employing IMS at the front-end of innovation or intending to do so. Table 2 reports the main articles which I used as inspiration for this review of literature<sup>2</sup>. I organized the review around four sections: the first two sections more generally discuss the diffusion of new technologies for innovation and the benefits arising from their use within the organizational boundaries to expand the search for ideas and solutions. As such, these sections link to the arguments presented at the beginning of the introduction in relation to firm-level innovation search processes. The last two sections are more specific as they focus on discussing extant research on IMS and their use at the front-end of innovation.

**Table 2. Inspiration for Theoretical Positioning**

<b>Authors</b>	<b>Main Focus</b>	<b>Methods</b>	<b>Main Findings</b>
<b>Section 1: The diffusion of new technologies for innovation</b>			
Adler et al. (2008)	Collaborative community	Conceptual	The principle of collaborative community has been growing of importance. Challenges and implications are discussed.
Bayus (2013)	Crowdsourcing systems	Quantitative	Serial submitters tend to generate less diverse ideas to those already implemented. This negative effect is mitigated by their diverse commenting

<sup>2</sup> The aim of this review is to identify and highlight stylized facts about the topic of IMS for innovation and thus to provide an overview of a subset of literature dealing with such topic. As such, the review is by no means exhaustive or systematic.

Dahlander and Piezunka (2014)	Online ideation platforms	Quantitative	activity to others' ideas. Organizations' proactive attention and reactive attention constitute two key actions to elicit suggestions from external contributors.
Dahlander and Gann (2010)	Open innovation	Literature Review	The review identifies two inbound processes: sourcing and acquiring, and two outbound processes, revealing and selling. Advantages and disadvantages of these different forms of openness are discussed.
Dahlander and Wallin (2006)	Online communities	Quantitative	Firms sponsor individuals to act strategically within a FOSS community.
Gorski and Heinekamp (2004)	IMS	Literature review	IMS have evolved from offline suggestion boxes to more interactive and collaborative systems.
Lakhani and Panetta (2007)	Distributed innovation	Conceptual	Distributed innovation systems are an alternative approach to organizing for innovation and accessing distributed knowledge.
Lee and Cole (2003)	Community-based model	Qualitative	A new model of community-based knowledge creation is developed based on the Linux Kernel development project.
Neyer et al. (2009)	Internal and external IMS	Qualitative	Development of a socio-technical framework for integrating external and internal innovators.
Piller and Walcher (2006)	Idea competitions	Qualitative and Quantitative	Internet-based toolkits for idea competitions are a novel way for organizations to access innovative ideas and solutions and realize open innovation.
Poetz and Scherier (2012)	Crowdsourcing	Quantitative	Users are able to compete with ideas developed by internal experts or innovators. Users' ideas score higher in novelty and customer benefit, but lower on feasibility.
Venkatraman and Henderson (1998)	Virtual organizing	Conceptual	Strategies for virtual organizing require attention to three vectors: customer interaction, asset configuration and knowledge leverage.

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### Section 2: Benefits of Performing IT-enabled, Intra-Organizational Search for Ideas

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Alexy et al. (2012)	Unsolicited ideas	Multi-method	Dealing with unsolicited ideas gives rise to three challenges: high quantity, low quality and transfer of IP ownership. A set of practices to deal with these challenges is identified.
Birkinshaw et al. (2011)	IMS	Qualitative	Online forums are not an answer for distributed innovation; Innovation should not always be open. Innovation should balance bottom-up and top-down approaches.
Boeddrich (2004)	Front-end of innovation	Qualitative	Identification of general and company-specific requirements for organizing the fuzzy front-end in generating a sustainable flow of ideas.
Fairbank et al. (2003)	IMS	Qualitative	Development of a model for employee suggestion systems based on the expectancy theory of motivation. Well-designed systems can enhance employee motivation, creativity and innovation.

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Frese et al. (1996)	Personal initiative at work	Quantitative	Differences in personal initiative at work are a result of occupational socialization rather than of a selection effect.
Henderson and McAdam (2001)	Decision-making	Qualitative	Discussion of benefits and shortcomings of the change evaluation approach as part of the management decision-making process in a fragmented organization.
Jeppesen and Lakhani (2010)	Broadcast search	Quantitative	Winning solution is positively related to increasing distance between the solver's field of technical expertise and focal field of the problem. Female solvers perform better than men in developing successful solutions.
Lakhani et al. (2012)	Open innovation	Conceptual	When critical tasks can be modularized and when problem-solving knowledge is widely distributed and available, open innovation complements traditional innovation logics.
Laursen (2012)	Firm-level innovation search processes	Literature review	Advantages and disadvantages of local search and non-local search are explored, organizational responses are discussed and potential exogenous triggers for different kinds of search are identified.
Oldham and Cummings (1996)	Employee creativity	Quantitative	Employees produced the most creative work when they had appropriate creativity relevant characteristics, worked on complex, challenging jobs, and were supervised in a supportive, non-controlling fashion.
Unsworth (2001)	Employee creativity	Conceptual	Development of a matrix of four creativity types: responsive, expected, contributory and proactive.
Unsworth and Parker (2003)	Proactivity and innovation	Conceptual	Employees' proactive and innovative behaviors help enhance the effectiveness of organizations.

### Section 3: Current Research on IMS

Axtell et al. (2000)	Generation and implementation of ideas	Quantitative	Suggestion of ideas is highly related to individual characteristics, whereas the implementation of ideas is related to group and organizational characteristics.
Björk and Magnusson (2009)	Idea networks	Quantitative	Interrelationship between individual and group network connectivity and innovation idea quality.
Bjork et al. (2011)	Social capital and ideation	Quantitative	The larger the size of an individual's ego network, the higher the individual's innovative performance in terms of high-quality ideas, whereas the larger the number of structural holes in an ego network, the lower the quality of ideas generated.
Deichmann and Stam (2015)	Leadership	Quantitative	Both transformational and transactional leadership is effective in motivating followers to commit to the goals of an ideation program. Increased commitment, in turn, is associated with more ideas that followers generate. The effect of transformational leadership is contingent on how strongly leaders identify with the organization.
Deichmann	Radical	Quantitative	Failures, rather than successes, of initiators

and Van den Ende (2014)	initiative taking in IMS		increase the likelihood of repeat initiative taking. Involving initiators with prior success in initiative taking has a positive effect on the outcome of a subsequent radical initiative.
Frese et al. (1999)	IMS	Quantitative	The most important factors related to having ideas, submitting suggestions and quality of suggestions are initiative at work, higher order need strength, self-efficacy, expected improvements in work and suggestion inhibitors (negatively).
Kijkuit and Van den Ende (2010)	Idea networks	Quantitative	Importance of strong ties, density, range, seniority and decision-maker involvement in specific phases of the front-end.
Mumford et al. (2002)	Leadership	Literature review	Leadership of creative people requires expertise. Moreover, the successful leader must employ a number of direct and indirect influence tactics.

#### **Section 4: Organizing the Front-End of Innovation through IMS**

Adamczyk et al. (2012)	Innovation contests	Literature Review	Important design elements of innovation contests are identified.
Afuah and Tucci (2012)	Crowdsourcing	Conceptual	Crowdsourcing may transform distant search into local search depending on four circumstances: the characteristics of the problem, the knowledge required for the solution, the crowd, and the solutions to be evaluated.
Amabile et al. (1996)	Creativity	Quantitative	Identification of work environment factors affecting employee creativity.
Baer (2010)	Idea networks	Quantitative	Actors are most creative when they maintain idea networks of optimal size, weak strength, and high diversity and when they score high on the openness dimension.
Baer (2012)	Implementation of ideas	Quantitative	Individuals were able to improve the negative odds of their creative ideas being realized when they expected positive outcomes to be associated with their implementation efforts and when they were skilled networkers or had developed a set of strong buy-in relationships.
Bjelland and Wood (2008)	IBM innovation jam	Qualitative	Difficulties and successes of IBM innovation initiative are discussed.
Borroughs et al. (2011)	Employee motivation	Quantitative	The effect of rewards can be made positive if offered together with appropriate training.
Bonabeau (2009)	Collective intelligence	Conceptual	Collective intelligence is better for idea generation than for idea evaluation. Managers need to consider many key issues when designing collective intelligence tools, from loss of control to the balance of diversity to expertise.
Burgelman (1983)	Strategic management	Qualitative	Firms need both diversity and order in their strategic activities to maintain their viability. Managing diversity requires an experimentation-and-selection approach. Top management's

			critical contribution consists in strategic recognition rather than planning.
Burt (2004)	Social networks	Quantitative	Compensation, positive performance evaluations, promotions, and good ideas are associated with people whose networks span structural holes.
Cooper (2008)	Front-end of innovation	Qualitative	Challenges of the stage-gate system are discussed and solutions identified.
Deci et al. (1999)	Motivation	Quantitative	Engagement-contingent rewards did not undermine intrinsic motivation. Completion-contingent and performance-contingent rewards reduced intrinsic motivation.
Eisenberger and Armeli (1997)	Motivation	Quantitative	The explicit requirement of novel performance for salient reward enhances generalized creativity without any loss of intrinsic creative interest.
Fuller (2006)	Motivation	Quantitative	Intrinsic interest in the innovation activity and curiosity are found to be the most important motives for consumers' willingness to engage in further virtual development activities.
Hargadon (2002)	Knowledge brokering	Qualitative	A model of the knowledge brokering process is developed.
Harhoff et al. (2003)	Motivation	Quantitative	Users benefit by freely revealing their innovations.
Howell and Boies (2004)	Champions of innovation	Quantitative	Flexible role orientation was positively related to idea generation, and contextual knowledge was positively related to packaging ideas for promotion. Idea generation was positively related to promoting ideas through informal and formal channels.
Jeppesen and Frederiksen (2006)	Motivation	Quantitative	Innovative users are likely to be hobbyists and responsive to firm recognition as a motivating factor for undertaking innovation.
Kim and Wilemon (2002)	Front-end of innovation	Conceptual	Several strategies to manage the front-end of innovation are suggested.
Koen et al (2001)	Front-end of innovation	Qualitative	The 'New Concept Development' model is developed to provide a common language and insights on the front-end of innovation.
Khurana and Rosenthal (1998)	Front-end of innovation	Qualitative	The greatest success comes to organizations that take a holistic approach to the fuzzy-front end, which links business strategy, product strategy and product-specific decisions.
Kock et al. (2014)	Front-end of innovation	Quantitative	Ideation portfolio management is conceptualized with three elements: ideation strategy, process formalization, and creative encouragement. All three elements independently and significantly contribute to front-end success.
Koput (1997)	Innovative search	Quantitative	Chaos can occur in specific organizational processes over particular periods of time.
Lakhani and von Hippel	Motivation in open source	Quantitative	Information providers are willing to perform field support tasks for free because of the direct

(2003)	software		learning benefits gained by them.
Leimester et al. (2009)	Crowdsourcing	Quantitative	Important design elements for IT-based idea competitions are identified.
Nonaka (1994)	Knowledge creation	Conceptual	Organizational knowledge is created through a continuous dialogue between tacit and explicit knowledge. The nature of this dialogue is examined and four patterns of interaction involving tacit and explicit knowledge are identified.
Ocasio (1997)	Attention	Conceptual	Firm behavior is the result of how firms channel and distribute the attention of their decision-makers. What decision-makers do depends on what issues and answers they focus their attention on.
Ostergaard et al. (2011)	Employee diversity	Quantitative	There is a positive relation between diversity in education and gender on the likelihood of introducing an innovation. Age diversity has a negative effect while ethnicity has no significant effect on the firm's likelihood to innovate. There is a positive relationship between an open culture towards diversity and innovative performance.
Perry-Smith (2006)	Social networks	Quantitative	Weaker ties are generally beneficial for creativity, whereas stronger ties have neutral effects. Centrality is positively associated with creativity when individuals have few ties outside of their organization, while the combination of centrality and many outside ties is not optimal.
Piezunka and Dahlander (2014)	Eliciting suggestions from contributors	Quantitative	Content, structural and personal distance have independent negative effects on the likelihood of attention. Crowding amplifies these negative effects.
Pisano and Verganti (2008)	Collaborative innovation	Conceptual	Development of a framework which focuses on two questions: How open or closed should membership in the network of collaborators be? How flat or hierarchical should the network's governance structure be?
Reagans and McEvily (2003)	Social networks	Quantitative	Both social cohesion and network range ease knowledge transfer, over and above the effect for the strength of the tie between two people.
Rochford (1991)	Front-end of innovation	Conceptual	Opportunity identification process may be incomplete in describing opportunity identification in practice among successful industrial firms.
Sandstrom and Bjork (2010)	IMS	Qualitative	Discussion of a dual IMS to handle incremental and radical ideas.
Scheiner (2015)	Gamification	Mixed	There are differences in game mechanics with respect to their motivational evaluation. Game mechanics with reference to social aspects are more highly appreciated.
Soukhoroukov	Front-end of	Quantitative	Idea markets are a feasible and promising method

a et al. (2012)	innovation		to support the fuzzy front-end of the new product development process.
Terwiesch and Xu (2008)	Innovation contest	Quantitative	The seeker can benefit from a larger solver population because he obtains a more diverse set of solutions. The inefficiency of the innovation contest can be reduced by changing the award structure from a fixed-price award to a performance-contingent award.
Toubia and Flores (2005)	Front-end of innovation	Quantitative	The potential to use customers in the screening of ideas is analyzed.
Tushman and Scanlan (1981)	Boundary-spanning	Quantitative	Informational boundary spanning is accomplished only by those individuals who are well connected internally and externally.
Utman (1997)	Motivation	Quantitative	Learning goals lead to better performance than do performance goals.
Uzzi (1997)	Social networks	Quantitative	Embeddedness promotes economies of time, integrative agreements, Pareto improvements in allocative efficiency, and complex adaptation. These positive effects reach a threshold after which embeddedness can reduce economic performance.
Whelan et al. (2011)	Employee networks	Qualitative and Quantitative	Idea scouts and idea connectors are influential in producing successful open innovation outcomes.
Van de Ven (1986)	Management of innovation	Conceptual	Four basic problems in managing innovation are discussed: (1) a human problem of managing attention, (2) a process problem in managing new ideas into good currency, (3) a structural problem of managing part-whole relationships, and (4) a strategic problem of institutional leadership.
Van den Ende et al. (2014)	Front-end of innovation	Conceptual	Discussion of challenges and tensions for organizing the front-end of innovation with the use of new online tools.
Van der Heijden (2004)	Hedonic information systems	Quantitative	Perceived enjoyment and perceived ease of use are stronger determinants of intentions to use than perceived usefulness. The hedonic nature of an information system is an important boundary condition to the validity of the technology acceptance model.
Van Dijk and Van den Ende (2002)	IMS	Qualitative	Development of the 'Creativity Transformation Model', which encompasses the main factors that influence the functioning of suggestion systems.

#### **4.1. The Diffusion of New Technologies for Innovation**

The advent of the Internet and the diffusion of new technologies have changed how organizations innovate, leading to new ways of organizing and managing innovation (Dahlander and Wallin 2006; Lakhani and Panetta 2007). By engaging a wider and more diverse crowd of contributors, these new technologies open up opportunities for sharing problems, ideas and solutions as well as for collaboration and co-creation activities within and across organizational boundaries (Dahlander and Piezunka 2014). Due to these opportunities, these technologies have received increasing attention over the last decades (Piller and Walcher 2006; Poetz and Schreier 2012; Bayus 2013; Piezunka and Dahlander 2014). Examples of these new tools for innovation include crowdsourcing platforms (Poetz and Schreier 2012), innovation contests (Terwiesch and Xu 2008), idea competitions (Piller and Walcher 2006), and innovation communities (Jeppesen and Frederiksen 2006).

Dahlander and Gann (2010) highlight that the diffusion of these web-enabled technologies may have important implications for organizations in terms of how knowledge is created and shared both internally and externally. As stated by Vaccaro et al. (2009, p. 1279), these new technologies “have the potential capability to create a virtual dimension through which individuals can share and create new knowledge at both a tacit and an explicit level”. As such, they allow individuals to virtually collaborate and interact in new ways (Dahlander and Gann 2010), to access different competencies and expertise (Jeppesen and Lakhani 2010) as well as to share and transfer knowledge more easily (Davenport 1998). Thus, they enable diverse knowledge and expertise within and across organizational boundaries “to become drivers of value creation and organizational effectiveness” (Venkatraman and Henderson 1998, p. 34). Moreover, by engaging distributed individuals, the diffusion of these new technologies opens up opportunities for more open and collaborative approaches to innovation (Sandstrom and Bjork 2010). This also reflects a change in the way innovation is

viewed – i.e. not anymore as something created by the lonely inventor, but increasingly as a collaborative and interactive process (Leonard and Sensiper 1998). Relatedly, it is claimed that organizations may move toward a community-based model of organizing innovation, by allowing geographically distributed employees to virtually interact and collaborate across various boundaries to generate innovation (Lee and Cole 2003).

#### **4.1.1. Evolution of IMS**

It is important to highlight that collecting employees' ideas is not a new phenomenon. In fact, different types of idea management initiatives and tools have been implemented by organizations during the last centuries (Neyer et al. 2009). However, these systems have evolved over time becoming more open and collaborative (Sandstrom and Bjork 2010) and leading to the integration of 'innovators' both inside and outside the organizational boundaries (Neyer et al. 2009). The first systems were introduced by Japanese firms which prompted the concept of involving all employees in innovation. Afterward, Western organizations started to use formal suggestion schemes for continuous improvement activities (Bessant 2003). The diffusion of information technologies and of the Internet has led to the development of more interactive and collaborative systems, opening up new opportunities for innovation (Sandstrom and Bjork 2010). As such, these systems have evolved over time from offline suggestion schemes and formal systems for continuous improvement to more interactive and advanced systems (Gorski and Heinekamp 2004). This development toward more interactive and collaborative IMS is important because it opens up new opportunities for distributed employees at any level to not only generate ideas, but also to virtually interact and collaborate among each other to further develop them (Deichmann and van den Ende 2014). At the same time, it creates new challenges for organizations in terms of how to design systems that assist in generating and maturing more and better ideas that eventually may drive downstream innovation. Relatedly, it opens up the question of how these web-enabled

technologies may be used to support and organize the early phases of the innovation process within organizations.

#### **4.2. Benefits of Performing IT-enabled, Intra-Organizational Search for Ideas**

As highlighted at the beginning of this introduction, a key argument of this thesis is that large organizations may benefit from performing a broader local search for ideas and solutions internally - across their various functional, hierarchical and spatial boundaries - by employing web-enabled IMS. In this respect, current research highlights different benefits stemming from employing IMS internally to more broadly search for ideas and solutions. First, the increasing use of IMS in large organizations can be related to the consideration that employees constitute a crucial source of innovation (Oldham and Cummings 1996; Terwiesch and Ulrich 2009). This includes not only employees in the R&D department, but also ‘peripheral inside innovators’ – i.e. employees working across the whole organization in different levels and functions (Neyer et al. 2009). As such, the diffusion of IMS reflects the increasing view of innovation as a “capability that harnesses the skills and imagination of employees at all levels” (Birkinshaw et al. 2011, p. 43). Arguably, as organizations become less hierarchical and progress towards flatter community structures of increased distribution of specialist knowledge (Adler et al. 2008), employees at different levels become able to contribute in new ways and in new roles in their organization. Empowered by the collaborative technologies of the Internet, many employees can collaborate and create new ideas that may lead to valuable innovations for their organization (Fairbank et al. 2003). In fact, employees possess specialized knowledge in their own domain which may be useful for organizations to identify new opportunities (Henderson and McAdam 2001). As stated by Unsworth and Parker (2003, p. 4), “employees know what is going on, what customers want and need, what inefficiencies lie in the system”. Moreover, accessing knowledge from different domains and areas of expertise may be beneficial to identify solutions to widely

broadcasted organizational-related problems (Jeppesen and Lakhani 2010). For instance, Jeppesen and Lakhani (2010) found that marginal individuals - coming from varied and distant fields - may possess unique knowledge and perspectives which may be used to solve problems in other domains (Jeppesen and Lakhani 2010). While these authors focus on marginal individuals outside the organizational boundaries, the same arguments may be extended to the internal crowd of distributed employees.

Second, studies in the organizational behavior field emphasize that the use of IMS within organizations may contribute to foster employees' proactive and innovative behaviors. By generating and maturing new ideas, employees are able to contribute beyond their work-related tasks (Frese et al. 1996; Unsworth 2001; Unsworth and Parker 2003; Deichmann and van den Ende 2014). For instance, in a study based on a company suggestion system, Frese et al. (1999) found that employees' self-efficacy and subjective initiative – dimensions which relate to employee proactive behavior – were key predictors of generating new ideas. As such, employees' involvement in ideation activities represents an example of initiative taking, “resulting in an individual taking an active and self-starting approach to work and going beyond what is formally required in a given job” (Frese et al. 1996, p. 38). Employees' proactive initiatives are argued to be crucial for organizations' performance (Unsworth 2001; Deichmann and van den Ende 2014). Hence, fostering this proactive behavior becomes important in the context of IMS considering that the performance of these systems depends on employees' voluntary participation (Reuter 1977).

Finally, current innovation studies discuss difficult IPR and appropriability issues encountered when capturing ideas from external individuals (Alexy et al. 2012; Laursen 2012). The fear of losing critical knowledge may contribute to explain why several organizations currently limit their search efforts within their organizational boundaries by involving instead the internal crowd of diverse and distributed employees (Birkinshaw et al.

2011; Björk et al. 2014). In fact, by searching internally organizations can benefit from employees' ideas without facing additional costs (Lakhani et al. 2012) or losing essential knowledge to the public (Lee and Cole 2003). Moreover, a study conducted by Poetz and Schreier (2012) shows that - compared to internally generated ideas - ideas from external sources score higher in terms of novelty and customer benefit, but lower in feasibility. This may open up some questions regarding the efficiency of distant search when it comes to the implementation and use of external ideas.

### **4.3. Current Research on IMS**

Together with highlighting the benefits of their implementation, current studies on IMS mainly focus on examining which individual and organizational-level factors affect the quantity and quality of the ideas generated on these systems (Frese et al. 1999; Bjork and Magnusson 2009; Bjork et al. 2011). On the one hand, it is claimed that generating a large amount of ideas is crucial to continuously feed the innovation process. A larger quantity of ideas may increase the possibilities to identify valuable ideas that can be taken further for implementation (Frese et al. 1999; Axtell et al. 2000). Hence, fostering a productive idea generation process is considered crucial when using IMS for innovation. Other studies consider the effect of leadership roles and behaviors on innovative outcomes, based on the insight that these roles may influence employees' generation of ideas (Mumford et al. 2002; Deichmann and Stam 2015). On the other hand, increasing the quantity of ideas may also raise some challenges for organizations in terms of how to manage the large amount of inputs generated and how to identify good ideas to move further (van den Ende et al. 2014). Thus, several scholars have started to explore which mechanisms may contribute to increase the quality of the ideas generated. Some of these studies examine the role of social networks in influencing employees' generation and development of ideas (Bjork and Magnusson 2009; Kijkuit and Van den Ende 2010). For instance, in a study of an online ideation platform,

Björk and Magnusson (2009) found a positive relationship between the idea provider's network connectivity and innovation idea quality. Finally, more recent studies investigate learning behaviors of idea submitters and how these may affect their innovative outcomes (Deichmann and van den Ende 2014).

#### **4.4. Organizing the Front-End of Innovation through IMS**

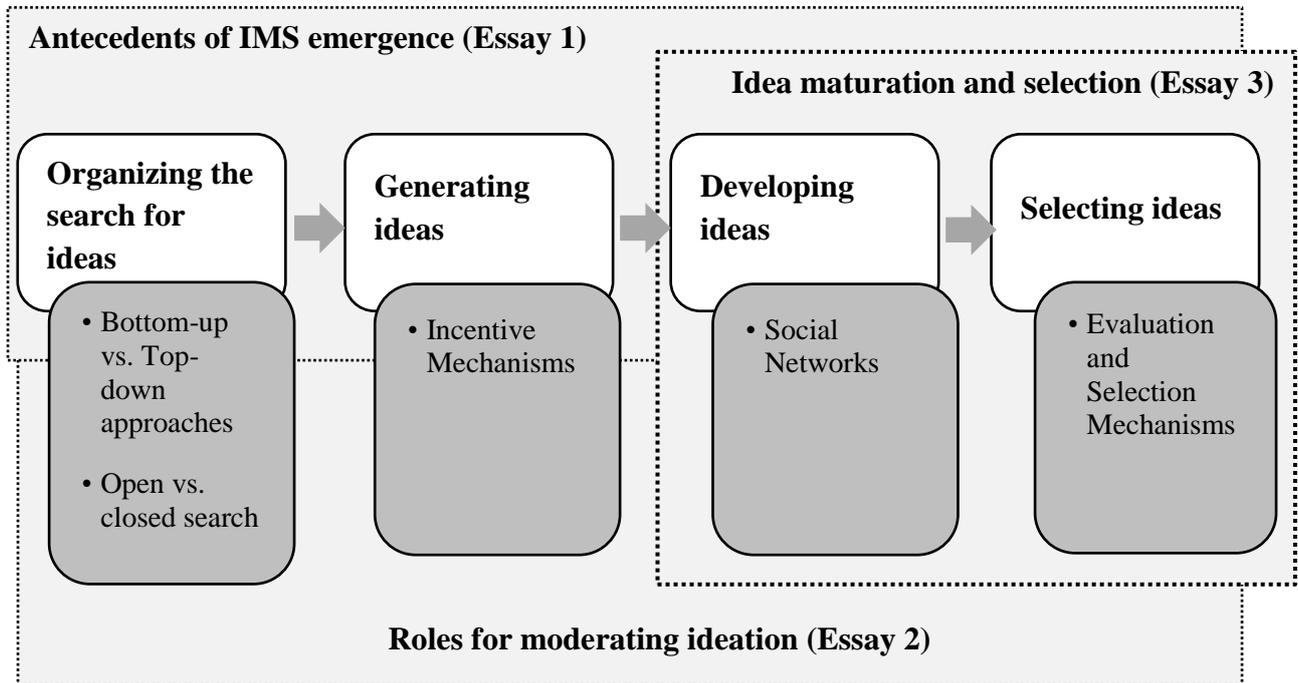
In this thesis I focus on unfolding the early phases of the innovation process where ideas emerge, are further developed and the most valuable ones are selected to be transferred into the traditional innovation funnel (Khurana and Rosenthal 1998). These early phases are argued to be crucial for organizations' innovative performance (Kijkuit and Van den Ende 2010; van den Ende et al. 2014). The front-end of innovation is regarded as a dynamic and iterative phase of the innovation process, being characterized by activities that are unstructured and uncertain (Koen et al. 2001). At the same time, these activities are crucial because they constitute the basis for the subsequent phases of innovation (Koen et al. 2001). Thus, effectively managing the fuzzy front-end constitutes a critical challenge for organizations (Kim and Wilemon 2002). However, studies on the front-end often address it conceptually or are mainly practitioner-oriented (Koen et al. 2001; Kim and Wilemon 2002; Cooper 2008), while empirical research is limited, especially in the area of IMS (van den Ende et al. 2014).

Current innovation studies highlight the importance for organizations to find new ways to effectively organize and manage the front-end of innovation. In particular, it is argued that organizations should implement new methods to access diversity of inputs and thus obtain new ideas and solutions. In fact, several actors with diverse knowledge, competences and expertise can contribute to the front-end of innovation (van den Ende et al. 2014). In this respect, the diffusion of IMS in large organizations opens up new opportunities for supporting, organizing and managing this important phase of the innovation process (Van

Dijk and Van den Ende 2002; Boeddrich 2004). It is stated that IMS can foster communication and collaboration across internal boundaries and thus facilitate knowledge sharing across the whole organization (Kim and Wilemon 2002). IMS may hold the potential to support the entire front-end of innovation process with respect to generating, developing and selecting ideas (Sandstrom and Bjork 2010), to expand innovation activities to the entire organization (Birkinshaw et al. 2011) as well as may contribute to the development of the capabilities needed to manage such phases in new ways (Bjork et al. 2010). This discussion, however, opens up several questions with regard to how these early phases of the innovation process are shaped by the diffusion of IMS for innovation.

Figure 2 depicts the key phases of the front-end of innovation process and related mechanisms discussed by current literature in relation to the use of new technologies for innovation. Many of the mechanisms discussed in these phases build on insights developed by innovation management studies on the design and use of external online innovation tools and technologies, such as crowdsourcing platforms and external online ideation platforms. However, they are relevant also in relation to the use of internal IMS at the front-end of innovation. Figure 2 illustrates the general framework of this thesis. Each of the three essays focuses on different aspects of the framework, but they all build upon it. In the next subsections I briefly review each of the key phases of the front-end of innovation to highlight existing gaps in the innovation management literature with respect to the implementation and use of IMS and emerging key tensions. This constitutes the starting point as well as the motivation for developing the three outlined essays.

**Figure 2. Overall Framework of the PhD Thesis: IMS and the Front-End of Innovation Process**



This framework depicts the key activities and phases constituting the focus of this thesis, namely: (1) organizing the search for ideas; (2) generating ideas; (3) developing ideas; and (4) evaluating and selecting ideas. It is important to highlight that these four phases usually do not occur in a sequential way, but they are rather iterative.

#### **4.4.1. Organizing the Search for Ideas**

The diffusion of new technologies for innovation opens up new opportunities for organizing the search for ideas and solutions both within and outside the organizational boundaries. More precisely, current research identifies two main ways of organizing such search: 1) problem solving (or top-down) approach; and (2) idea generation (or bottom-up) approach.

The use of the problem solving approach can be observed in the various innovation tools that have been introduced in the last decades, such as crowdsourcing platforms (Poetz and Schreier 2012) or ideas competitions (Piller and Walcher 2006). In these cases, organizations broadcast a specific problem to a crowd of distributed and diverse individuals to obtain

targeted solutions (Jeppesen and Lakhani 2010). Potential solvers can then decide to participate to solve it (Afuah and Tucci 2012). Thus, this approach enables access to ‘solution information’, by encouraging individuals to provide a potential solution to an organizational-related problem (Piller and Walcher 2006). As such, it enables to attract many potential solvers from different domains. It is argued that the top-down approach is important to provide direction and thus to guide ideation efforts toward specific organizational areas or issues (Bjork et al. 2010; Birkinshaw et al. 2011). It thus ensures that ideas and solutions are aligned with organizational goals and requirements (Birkinshaw et al. 2011). On the other hand, the bottom-up approach is considered essential for individuals’ engagement in innovation (Birkinshaw et al. 2011). This approach enables distributed individuals to voluntarily submit unsolicited ideas (Alexy et al. 2012), hence providing them with freedom and autonomy in their ideation efforts (Bjork et al. 2010). At the same time, by not defining any particular area or issue, it enables to collect a larger amount of ideas compared to a problem driven approach (van den Ende et al. 2014). This discussion can also be related to the distinction introduced by Burgelman (1983) between autonomous and induced strategic behavior in organizations. While induced strategic behavior focuses on areas that are already familiar for the organization, autonomous strategic behavior takes place outside of its current focus or strategy (Burgelman 1983). It may then “provide the basis for radical innovation” (Burgelman 1983, p. 1350).

Hence, a current debate in the innovation management literature is to what extent the search for ideas should be driven by a top-down approach (Bjork et al. 2010; Birkinshaw et al. 2011). The problem with excessive direction may be that employees’ search efforts become constrained, thus increasing the risk of missing more radical opportunities (Bjork et al. 2010). At the same time, if employees’ efforts are not guided in a certain direction, the generated ideas may result of little use for the organization (Bjork et al. 2010). Hence, “achieving both

objectives simultaneously generates tension” (van den Ende et al. 2014, p. 2). A better understanding is thereby needed about how to balance direction and freedom in the search for ideas when implementing and using new technologies for innovation.

Moreover, another key consideration relates to whether the search for ideas and solutions should be open or closed. For instance, Pisano and Verganti (2008) posit that understanding when to choose between a more open or closed search is essential, as different benefits are associated with each approach. They argue that a more closed approach may be beneficial when organizations have identified key contributors from whom to collect ideas and the areas to be investigated. On the other hand, a more open approach has the potential to attract a larger number of solutions and ideas as well as to tap into the broader contributors’ diversity (Pisano and Verganti 2008; Terwiesch and Xu 2008). However, it may not enable to access the most relevant individuals needed to solve a problem and the screening costs may increase (Pisano and Verganti 2008). Hence, more insights are needed on how to exploit the synergies of these two approaches. Overall, a better understanding is needed on how organizations manage the search for ideas and solutions through the use of IMS and how they consider the outlined approaches.

#### **4.4.2. Generating Ideas**

The generation of new ideas is an essential part of the front-end of innovation process. Especially when intending to fully exploit employees’ creativity, organizations face the challenge of how to engage them in innovation. This challenge becomes crucial with the diffusion of new technologies such as IMS, which enable employees across the whole organization to contribute to innovation.

The question is then how organizations can foster a higher level of participation from employees. Various studies in the psychology field have investigated individuals’ motivation

to engage in innovation by distinguishing between intrinsic and extrinsic motivation (Amabile et al. 1996; Deci et al. 1999). It is argued that intrinsic motivation plays a key role for individuals' engagement in innovation (Amabile et al. 1996). Intrinsic motivation relates to an individual's engagement in a task because of the inherent interest in it (Utman 1997). On the other hand, extrinsic rewards for generating ideas are argued to have both positive and negative effects (Eisenberger and Armeli 1997; Deci et al. 1999). For instance, it is stated that extrinsic rewards may inhibit intrinsic motivation - and thus affect creativity in a negative way - when they are offered in isolation (Deci et al. 1999). However, they may have a positive effect on creativity if they provide useful information and recognize individuals for their contributions (Eisenberger and Armeli 1997). Similarly, extrinsic rewards may have a positive effect on creativity when offered together with appropriate training activities (Burroughs et al. 2011).

When using IMS for innovation a key issue is then how to design and structure incentive mechanisms to support and encourage employee engagement. Recent innovation studies highlight that designing incentives, both financial and non-financial, is crucial to foster participation in collaborative innovation (Pisano and Verganti 2008). However, most studies have focused on the factors affecting the motivation of external individuals to participate in innovation contests, online communities or online ideation platforms. For instance, Jeppesen and Lakhani (2010) found that financial incentives are important for fostering participation in online contests, as individuals expect to be rewarded when solving organizations' problems. Füller (2006), on the other hand, claims that online platforms should be designed to foster intrinsic motivation by making participation fun for individuals rather than offering monetary rewards. Other studies show that aspects such as firm or peer recognition, learning experience or the value of the social practice also influence individuals' participation behavior (Harhoff et al. 2003; Lakhani and von Hippel 2003; Jeppesen and Frederiksen 2006; Krogh et al.

2012). However, while it may be possible to relate the motives driving external actors' engagement to those driving employees, it is not clear how these various incentives may affect employees' innovative behaviors and outputs in relation to participation to IMS. At the same time, considering the interactive nature of IMS, a key question is how to design incentives that can encourage knowledge sharing and collaborative behaviors among employees (Bjork et al. 2010).

Moreover, current research places increasing attention on the implementation of a new approach, often labeled as 'gamification', for engaging individuals in online ideation platforms. Gamification involves the usage of game elements and mechanics to drive participation (Deterding 2011). Based on the consideration that experiencing fun when using a system may foster participation (van der Heijden 2004), it is argued that gamification may constitute a promising approach to ensure repeated ideation efforts (Scheiner 2015). However, there is still limited knowledge about the role of gamification and how it may affect employees' motivation to participate to IMS.

#### **4.4.3. Developing Ideas: The Role of Social Networks**

Merely generating ideas is not enough. Ideas need to be further developed and realized as innovations in order to provide benefits to organizations (Van de Ven 1986). Developing ideas is especially important considering that ideas constitute "raw materials" when generated (Rochford 1991). Current research points to the importance of social networks for the development of new ideas (Ostergaard et al. 2011; Deichmann and van den Ende 2014). In fact, developing ideas is often considered a collaborative process (Burt 2004; Perry-Smith 2006). Employees may benefit from discussing their ideas with other employees coming from different parts of an organization (Kijkuit and Van den Ende 2010). Hence, interactions between individuals with diverse knowledge sets and perspectives can be beneficial for innovation (Nonaka 1994). These interactions enable them to build on each other's

experiences and competences (Deichmann and van den Ende 2014), get support and resources for their ideas (Howell and Boies 2004) and access novel information (Burt 2004). As such, they may add diverse perspectives to an idea which can be beneficial to further improve it (Deichmann and van den Ende 2014).

Several studies have investigated the types of network structure and relations that affect the development and selection of ideas. For instance, various insights have been developed on the effect of network properties such strength of ties or brokerage. On the one hand, it is claimed that weak ties are beneficial for innovation as they provide access to novel information (Burt 2004; Perry-Smith 2006). At the same time, individuals acting as brokers can combine and transfer ideas across diverse domains (Hargadon 2002). On the other hand, other studies highlight the benefits of strong ties and dense networks for sharing complex and tacit knowledge (Reagans and McEvily 2003) and for obtaining resources to develop ideas (Uzzi 1997). They also foster the creation of trust and willingness to help (Reagans and McEvily 2003), thus increasing the opportunities for cooperation (Kijkuit and Van den Ende 2010).

More recent innovation studies have started to investigate idea networks in large organizations, where ideas are generated and developed by employees in both formal and informal settings (Bjork and Magnusson 2009; Baer 2010). For instance, Kijkuit and Van den Ende (2010) posit that idea networks with a sparse and large structure are more beneficial during idea generation and development, while smaller and denser networks are more beneficial in the subsequent stages. This would enable to leverage the benefits associated with such structures in each innovation phase. Especially for the development of ideas, it is claimed that having a network with several contributors and structural holes may be beneficial to share diverse sources of information and non-redundant knowledge (Kijkuit and Van den Ende 2010).

The diffusion of IMS in large organizations opens up new opportunities to engage distributed individuals both in idea generation and idea development activities (Deichmann and van den Ende 2014). However, current studies mainly focus on exploring structural elements of idea networks, while little attention is placed on directly examining the content that contributors transfer (Baer 2010; Piezunka and Dahlander 2014). Content relates to the various sources of knowledge diversity, expertise and experiences that employees bring into the ideation process (Baer 2010; Kijkuit and Van den Ende 2010). A key question is then what types of knowledge diversity are more beneficial to mature and develop submitted ideas and how they may affect their subsequent selection. Hence, these gaps in research leave room for further investigations of the heterogeneity of interactions occurring in online ideation platforms, both from a structural and content point of view.

#### **4.4.4. Evaluating and Selecting Ideas**

The ideas generated by individuals do not necessarily become implemented (Baer 2012). A crucial issue faced by organizations is how to screen and evaluate the large amount of ideas generated on IMS and thus how to select those to be transferred into the traditional innovation funnel for implementation.

This issue is exemplified by the case of IBM. During 2006 Innovation Jam, IBM was able to engage more than 150,000 employees and external participants in ideation activities (Bjelland and Wood 2008). By exploiting a large crowd, this jam led to the generation of more than 46000 ideas (Bjelland and Wood 2008). However, it also created a new challenge for the organization: how to screen the large amount of ideas provided by widely distributed participants. Similarly, many organizations often struggle to manage this important phase of the innovation process. As stated by van den Ende et al. (2014, p.1), the problem is that “the number of ideas generated may become disproportionate to the computational and selective

capacity of firms”. As a consequence, “firms might simply be confronted with ‘too many’ ideas and face the problem of not being able to filter and select the most promising ones” (Poetz and Schreier 2012, p. 254). This may raise two key challenges in the evaluation and selection process. First, as the number of ideas generated increases, the screening and selection costs grow as well (Alexy et al. 2012). Second, organizations are able to consider only a restricted number of ideas due to their limited attentional capabilities (Koput 1997; Ocasio 1997). As a consequence, these challenges may affect the outcome of this process as valuable ideas may become disregarded or rejected (van den Ende et al. 2014).

Furthermore, these challenges highlight the importance for organizations to develop proper evaluation and selection mechanisms. This entails the creation of a formal process that ensures that employees’ ideas are handled in an efficient and comprehensive way (Soukhoroukova et al. 2012). This is important to ensure that organizations assign resources to the most relevant ideas (Kock et al. 2014). For instance, Kock et al. (2014) posit that organizations should take a portfolio approach during the ideation process to simultaneously support and balance variation and selection of ideas. Although recent studies have started to investigate this important issue, more understanding is needed about the evaluation and selection of ideas on IMS. Another key issue is how to design the selection process in a way that does not disrupt future ideation efforts of submitters (Bayus 2013).

Moreover, the challenge of screening a large amount of ideas has led organizations to start allocating the initial filtering process to the crowd (Alexy et al. 2012). This is done, for example, by creating a voting mechanism and thus by allocating some decision-making power to the crowd of distributed individuals. Different scholars have debated about the benefits of using the collective intelligence of the crowd in the evaluation process. Toubia and Flores (2005), for instance, suggest that it may be beneficial to include users in the idea screening process. “While experts are more sensitive and responsive to solution information,

consumers are more sensitive and responsive to need information” (Toubia and Flores 2007, p. 354). On the other hand, Bonabeau (2009) posits that collective intelligence may work better in idea generation than in idea evaluation. While tapping into the collective intelligence enables to access a wider diversity of inputs, this may not be beneficial in the evaluation process if the crowd does not possess the right expertise (Bonabeau 2009). As a consequence, the risk is that promising ideas may be rejected by the crowd (Bjelland and Wood 2008).

Hence, the diffusion of new technologies for innovation such as IMS opens up new challenges for organizations with regard to how to balance variation and selection of ideas at the front-end of innovation (van den Ende et al. 2014).

#### **4.4.5. Roles Supporting the Front-end of Innovation Process**

Previous studies in the innovation management field have investigated different roles that support the early phases of the innovation process. Salient examples are represented by champions for innovation, innovation brokers or boundary spanners (Tushman and Scanlan 1981; Hargadon 2002; Howell and Boies 2004). These roles are claimed to be important because they contribute, for instance, to develop employees’ ideas, to gather resources and management support for their implementation, to scan ideas in different environments or to transfer them across different boundaries and parts of an organization. However, it is argued that the diffusion of the Internet and new technologies may open up opportunities for the emergence of new roles facilitating and supporting the innovation process in virtual settings and in more distributed ways (Whelan et al. 2011). In particular, it is possible to observe the emergence of a new set of actors - often labeled as moderators or facilitators - who become responsible for facilitating ideation. These actors may play an influential role in supporting the early phases of the innovation process through the use of IMS. For instance, it is claimed that they may encourage and guide the creation of an “active community of innovators” (Adamczyk et al. 2012, p.350) with their actions and choices (Leimeister et al. 2009). At the

same time, as these new technologies enable to span different internal boundaries within an organization, moderators may potentially assume a broader role in ‘wiring’ innovation across the whole organization (Whelan et al. 2011). Thus, they may facilitate and support the generation, development and selection of employees’ ideas in more distributed manners. While previous studies have mainly focused on investigating roles supporting innovation in more traditional channels, less clear is what these emerging moderating roles look like, how they work and why they may be important.

#### **4.4.6. Summary of the Theoretical Positioning and Research Gaps**

As highlighted in this brief review of literature, a part of the innovation management research mainly focuses on the diffusion of new web-enabled tools and technologies to access external and internal sources of innovation. At the same time, current studies on IMS mainly emphasize the benefits of implementing such systems to generate innovation from internal sources and expand intra-organizational search efforts. Moreover, these studies have the tendency to focus on the outcome of IMS by examining the factors driving the quantity and quality of the ideas generated. However, when reviewing the different phases of the front-end of innovation process, different questions in relation to how to organize and manage it through the use of these new technologies for innovation remain unanswered. Hence, it is possible to identify different research gaps with regard to the implementation and use of IMS in the early phases of the innovation process. In general, the tendency of current studies to focus on the benefits of IMS implementation and the output generated leaves room for further investigations about the process of organizing for innovation – i.e. how to organize, support and manage the process of search, generation, development and selection of employees’ ideas through the use of IMS, which constitutes the main focus of this thesis.

Furthermore, the three essays part of this thesis focus on three specific gaps emerging from this brief review of literature. First, little is known about the drivers behind managers’

decision to implement IMS for innovation and how these may affect their subsequent development and implementation. In fact, current studies hint that the implementation of IMS relates to organizations' need to generate innovation such as new products, processes or services. Generating and developing as many ideas as possible to feed the innovation process is then argued to be crucial for organizations' innovative performance. However, alternative explanations for why IMS emerge are overlooked. I suggest that these functionalistic explanations offered by current research may provide incomplete or misleading conclusions on the use of IMS for innovation, hence requiring an investigation of alternative accounts for why and how managers implement them. This is also important considering the observed differences in their implementation and performance levels across organizations. Second, in this brief review I highlighted the existence of limited knowledge about the role of moderators in supporting the front-end of innovation. While these emerging moderating roles may play a key role in facilitating employees' ideation efforts on IMS, little is known about how they work as well as which tasks they perform to moderate the various phases of the front-end of innovation and related emerging tensions. Third, there is limited knowledge about the maturation and selection processes occurring on IMS after an idea is generated. More precisely, a better understanding is needed of the factors affecting the selection of ideas. While it is claimed that employees' interactions may play a key role for the development and selection of ideas, the diversity of knowledge and expertise that they bring into such process is often neglected (Baer 2010). Besides, current innovation studies have mainly focused on structural characteristics of idea networks or on the characteristics of the individual submitters. A key question is then which types of contributors' knowledge diversity may help mature ideas better for selection. At the same time, little attention is placed on investigating how ideas are formulated by the submitters on these platforms and their content and whether such aspects may have an effect on organizations' selection

decision. Considering that a key problem in this phase is that great ideas may potentially be rejected or bad ideas be selected, I posit that it is important to study how contributors and the idea itself affect idea selection.

## **5. Research Approach**

In this thesis I adopt both qualitative and quantitative methods to address the general research question. In this section I provide a brief overview of the research approach employed in each of three essays and related motivation. Each essay in the thesis explains in more detail how and why certain methods were selected and employed as well as how data collection and analysis were conducted. This is why I address these aspects only descriptively and to a limited extent in this introduction.

The first two essays adopt a qualitative, exploratory approach as they aim at shedding more light on the important phenomenon of IMS for innovation and thus at generating more detailed insights on it. In this respect, exploratory research questions enable to observe “what is happening, seek new insights and assess phenomena in a new light” (Robson 2002, p. 59). Also, a qualitative method enables the collection of rich data “with strong potential for revealing complexity” (Miles and Huberman 1994, p. 10). In both essays I decided to employ a case study approach as the main research design. More precisely, in the first essay I employed a qualitative, multiple-case study of five large organizations in Denmark to explore why and how managers choose to develop and implement IMS in different ways. In this case, the choice of employing a multiple-case study suited my purpose of capturing and discussing the variation in managers’ assumptions, strategic considerations and interpretations when developing and implementing IMS across the different organizations. Besides, the advantage of using multiple-case studies is that “the evidence from multiple cases is often considered more compelling and the overall study is regarded as being more robust” (Yin, 2009, p. 45).

Because their results are based on multiple evidence, multiple cases are usually considered more generalizable than single-case studies (Yin 2009). The second essay employs a single case study to explore how the ideation process is moderated and managed in IMS. In this case, I employed a single case study to conduct a detailed and intensive analysis of an emergent phenomenon, the moderation of ideation, whose knowledge is still limited. I conducted this study in a large organization headquartered in Sweden. This organization was selected because it constitutes an unparalleled case (Yin 2009). In fact, it has established over the years a dedicated web-enabled ideation system based on virtual idea boxes and on the introduction of a specific moderator role to facilitate employees' ideation efforts. As such, this case study enables to develop a rich understanding of the moderation of ideation.

The selection of the organizations to be included in these two essays followed different criteria. First, I selected large organizations which recently have worked with IMS in order to explore their use at the front-end of innovation. As previously mentioned, I focus on large-sized organizations due to the opportunities to span various internal boundaries through the use of IMS. Moreover, in the first essay the five organizations were selected from different industries and with different experiences concerning the implementation and use of IMS (relatively successful and unsuccessful) to provide further variation. Many of these organizations were contacted via a snowballing approach, in which initial contacts to university researchers at Aarhus University and KTH Royal Institute of Technology gave access to other contacts. I report more detailed considerations on the selection criteria for the organizations included in this thesis and their characteristics in each of the two essays.

Moreover, it is important to highlight that both essays do not focus on theory building but rather on theory elaboration. As such, they attempt to “simplify, reconnect, and redirect theory” (Lee et al. 1999, p. 166) to develop a more detailed understanding of the phenomenon under consideration. The selected organizations enable to collect rich data with the aim of

both developing theoretical categories and expanding theoretical links not sufficiently addressed by existing theory (Lee et al. 1999; Lawrence et al. 2002). In both essays I collected data from multiple sources, including interviews, archival documents, field trip to local offices and observations. Semi-structured interviews constituted the primary source of data collection, although secondary sources led to a better understanding of each case context by providing additional insights (Forster 2006). I chose to conduct semi-structured interviews because they provide more flexibility to interviewees during the interview process (Yin 2009).

Finally, in the third essay I employed quantitative data for hypothesis testing. In this case, the aim of this essay was not to explore a phenomenon, but rather to explain which factors affect the selection of ideas. As such, I developed a deductive model which shows the selected independent variables and their hypothesized effects on the outcome variable (i.e. the selection of ideas) as well as their interaction effects. More precisely, I conducted a statistical analysis to examine the effect of both idea characteristics and contributors' characteristics on idea selection. This analysis was performed on a rich and extensive dataset of 726 ideas and 2925 comments submitted on an online ideation platform of a large Danish firm over the course of 16 months. Also, I conducted a social network analysis to develop some of the measures of contributors' diversity included in the model. Table 3 summarizes the methods used for each essay and related data sources.

**Table 3. Methods and Data Sources of the Three Essays**

<b>Essay Number and Title</b>	<b>Approach</b>	<b>Method</b>	<b>Data Sources</b>
Essay 1: “Emergence and Implementation of Idea Management Systems: Legitimacy-Seeking and Goal-Oriented of Managers”	Explorative Inductive Theory Elaboration	Qualitative  Multiple-case study of five large organizations in Denmark	23 semi-structured interviews  Archival documents  Non-participant observations
Essay 2: “Moderating Ideation in Web-Enabled Ideation Systems”	Explorative Inductive Theory Elaboration	Qualitative  Single case study of a large organization headquartered in Sweden  Embedded case study	28 semi-structured interviews  Archival documents  One-week trip to local offices and observations
Essay 3: “Why Do Ideas Get Selected? Idea Selection in an Online Ideation Platform”	Confirmative Deductive Theory Testing	Quantitative  Statistical analysis  Social network analysis	Online ideation platform (726 ideas and 2925 comments)  HR employee-related data  Informal interviews

## 6. Overview of the Essays in the Thesis

As presented before, the general research question addresses how the use of IMS in large organizations contributes to shape and support the process of search, generation, development and selection of employees’ ideas. I operationalized this question into three narrower questions to develop detailed knowledge and thus provide opportunities for more specific theoretical discussions and for developing managerial implications. These essays investigate the role of IMS for innovation from different perspectives. Below, I present the three essays individually, their research questions and their contributions to literature.

## **Essay 1: “Emergence and Implementation of Idea Management Systems: Legitimacy-Seeking and Goal-Orientation of Managers”**

*RQ1: "How does the strategic thinking and emergence of an idea management system in large organizations impact on its development and implementation?"*

This essay explores why and how managers develop, design and implement internal IMS for innovation in different ways. By examining managers’ strategic thinking in relation to the set-up of an IMS, the aim of this study is to provide a more detailed process-oriented understanding about this important phenomenon.

Several innovation studies have taken a more functionalistic approach, by mainly focusing on the output of IMS in terms of quantity and quality of the ideas generated as well as on the benefits of implementing these systems internally. These studies hint that the emergence of IMS is mainly related to organizations’ need to generate innovation such as new products, processes or services. However, I suggest that they may tend to disregard alternative explanations behind managers’ decision to implement and use IMS. At the same time, while more recent studies emphasize the importance of exploring the innovation process in organizations and its complexities (Garud et al. 2013), little attention is placed on understanding the antecedents of IMS emergence. More precisely, innovation management studies rarely explore managers’ strategic thinking for innovation – i.e. the motivations, considerations, interpretations and assumptions driving their decision to set up a system for innovation.

Building on institutional theory and strategic management literature, this essay develops a theoretical contribution to organizational research by identifying two alternative explanations for why and how managers implement these new technologies for innovation: legitimacy-seeking and goal-orientation. As such, these findings may challenge more functionalistic

explanations for organizing innovation offered by current research. Contrary to what current research suggests, these findings indicate that generating innovation seems to constitute a secondary motivation in managers' thinking. Managers' adoption decision is mainly driven by the need to either become as similar as possible compared to relevant benchmarks and gain the right legitimate status from employees (legitimacy-seeking) or to achieve a specific purpose (goal-orientation). Moreover, the findings of this essay show how both internal and external drivers and managers' interpretative schemes may contribute to bias the way an IMS is constructed to the point that it may lose important functionality. Hence, these findings show the importance of incorporating insights from institutional theory and strategic management literature to better understand the implementation of new technologies for innovation.

Finally, this essay engages in a discussion concerning the use of online tools and technologies to support the generation, collection, maturation and selection of innovative ideas. This work offers suggestions to innovation scholars: focusing attention solely on the benefits of implementing IMS or on the innovation generated (e.g. output) may lead to partial or misleading conclusions about why these systems are implemented and why we observe differences in their performance levels. Thus, this study provides alternative accounts that may be beneficial to better understand the phenomenon of IMS. This is also important relative to the increasing diffusion of new web-based tools and technologies for innovation, such as online communities or crowdsourcing platforms.

## **Essay 2: “Moderating Ideation in Web-Enabled Ideation Systems”**

*RQ2: “How is the ideation process moderated and managed in web-enabled ideation systems?”*

This essay focuses on exploring how the ideation process is moderated and managed when using web-enabled ideation systems. The increasingly collaborative and open character of ideation has opened up new possibilities to have roles that facilitate and support ideation within organizations. This essay investigates an emerging set of actors – broadly labeled as ‘moderators’ – who assume the informal role within organizations of facilitating employees’ ideation efforts. However, as this represents a new phenomenon, there is limited knowledge about what these facilitating roles look like as well as how they work. By drawing on a qualitative, inductive case study of a large organization headquartered in Sweden, this study aims to provide a more detailed understanding about this increasingly important phenomenon.

This essay develops a theoretical contribution to the innovation management literature by showing how moderating ideation entails key interventions directed at managing the front-end of innovation in a distributed manner. The findings of this essay may provide important insights on how to manage this uncertain phase of the innovation process when using online ideation systems. Building on this, this study identifies three key antecedents of moderating ideation that may have an influence on how the ideation process is moderated and thus may have consequences on subsequent ideation performance: moderators’ flexible role orientation, initial motivations and time available for innovation. Moreover, this essay contributes to the discussion about managing tensions in the front-end of innovation by identifying three key paradoxical issues of moderating ideation and corresponding moderators’ strategies to manage them: (1) search behavior focus; (2) the extent of direction in driving search behavior; and (3) goal-setting to influence employees’ ideation efforts. Relatedly, it identifies and discusses a new tension between the use of performance targets and incentives which has not been previously addressed by the innovation literature.

Overall, this work has implications for innovation management scholars because it shows the importance of investigating moderating roles when it comes to ideation. Exploring how the ideation process is managed and moderated by these emerging actors may also contribute to a more detailed understanding of how these systems can be maintained and sustained over time and thus may partly contribute to explain their different performance levels.

### **Essay 3: “Why Do Ideas Get Selected? Idea Selection in an Online Ideation Platform”**

*RQ3: “How do the heterogeneity of contributors to an idea and the characteristics of the idea itself affect an organization’s decision to select it for funding?”*

While current innovation literature focuses on how to generate variation by increasing the number of ideas organizations can access, little attention is placed on understanding what happens after an idea is generated. In particular, little is known about the maturation process occurring after an idea is submitted on an online ideation platform - where contributors engage in discussing it - and how this affects its selection.

This study addresses this research gap by examining the factors affecting organizations’ decision to select a given idea (or not) for funding. In particular, whereas prior studies investigate the effect of particular structural characteristics of employees’ interactions on ideation performance, this essay focuses on exploring the effect of two key factors which have been quite overlooked by current research: (1) the heterogeneity of contributors to ideas and (2) the characteristics of the ideas. First, I examine how different types of contributors’ knowledge diversity (i.e. in terms of functional assignments, geographic locations and status) may help mature ideas better for selection. Second, I suggest that organizations’ decision to select an idea may also be influenced by the characteristics of the idea itself, such as the type of idea, its length and the positive/negative sentiments expressed by the submitter in the idea description.

Based on a rich and extensive dataset of 726 ideas and 2925 comments submitted on an online ideation platform of a large Danish firm over the course of 16 months, this study employs a probit model to explore the effect of these two factors on the likelihood of an idea being selected. The findings of this essay suggest that both the characteristics of an idea and contributors' diversity increases the chances of an idea being selected. The contribution of this essay lies in developing theory about the initial maturation process occurring after an idea is submitted in an online ideation platform, where other employees engage in discussing it. In particular, the findings of this essay indicate that contributors' diversity (especially in terms of functional assignments) play a crucial role in idea selection. Thus, their diverse inputs are important to further mature and refine initiated ideas before their selection. Conversely, I found that other contributors' characteristics such as geographic locations and status do not affect idea selection. Finally, this essay shows that certain characteristics related to the way an idea is formulated by the submitter on the platform as well as its type (process vs. product) also have a significant impact on the success chances of an idea.

Overall, this study contributes to the innovation management literature and social network theory by showing the importance of directly examining the content that contributors transfer to ideation networks and, thus, the different types of knowledge diversity that they bring to submitted ideas. Furthermore, this study contributes to innovation management literature by showing that the characteristics of an idea constitute an important mechanism for idea selection, an aspect which has been quite overlooked by current research.

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# Essay 1

## Emergence and Implementation of Idea Management Systems: Legitimacy-Seeking and Goal-Orientation of Managers<sup>3</sup>

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### Abstract

We develop a model that explains why and how managers in large organizations choose to design, develop and implement internal idea management systems in different ways. While prior studies have elaborated on the benefits of using these systems internally to generate innovation, we suggest that they often discard alternative explanations for why managers decide to implement them. We draw on a qualitative, multiple case study of five large organizations to examine managers' strategic thinking in relation to the development and implementation of an idea management system. We identify two alternative explanations for why and how managers implement these new technologies for innovation. We find that managers' adoption decision is mainly driven by the need to either become as similar as possible compared to relevant benchmarks and gain the right legitimate status from employees (legitimacy-seeking) or to achieve a specific purpose (goal-orientation). As such, our findings challenge more functionalistic explanations for organizing innovation offered by current research. Moreover, we show how both institutional mechanisms and managers' interpretative schemes contribute to bias the way an idea management system is constructed to the point that it may lose important functionality. Implications for both organizational research and practitioners are discussed.

**Keywords:** *Idea management; new technologies; front-end of innovation; strategic thinking; institutional and competitive mechanisms; interpretative schemes*

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<sup>3</sup> A previous version of this essay was presented at the Academy of Management conference 2014. The essay was under review in *Organization Science* but it was rejected afterwards. I am currently working on incorporating reviewers' suggestions and on preparing an improved version of the essay for submission to another journal.

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## **1. Introduction**

During the recent decade various technologies and tools have been introduced to support the generation, collection, maturation and selection of innovative ideas. Salient examples include the diffusion of crowdsourcing platforms to capture ideas from external contributors (Bayus 2013; Dahlander and Piezunka 2014) or online communities for virtual collaboration (Faraj and Johnson 2011). At the same time, large organizations increasingly adopt web-enabled idea management systems (IMS) to engage the diverse and distributed crowd of employees in innovation efforts (Kijkuit and Van den Ende 2010). This is also happening because firms recognize that proper management of the front-end of innovation, in which ideas are generated, is imperative for their innovative success (van den Ende et al. 2014). In this respect, the use of IMS in large organizations is crucial to support and organize the early phases of the innovation process (Boeddrich 2004). A key question is, however, why organizations decide to implement these new technologies for innovation and how this adoption decision affects the way IMS are subsequently developed and implemented.

While extant research addresses to what extent various individual or organizational level variables drive the outcome of IMS (Frese et al. 1999), our knowledge about the antecedents of why and how these systems are developed and implemented is limited. Many studies have taken a more functionalistic approach, focusing on the output of these systems in terms of quantity and quality of submitted ideas (Bjork and Magnusson 2009; Bjork et al. 2011). Generating a continuous inflow of ideas is then argued to be crucial to drive innovation. However, scholars emphasize the importance of understanding the innovation process and its complexities (Garud et al. 2013). And, relatedly, understanding how IMS are used to expand organizational search for new ideas and solutions by spanning internal boundaries, thus connecting dispersed areas of knowledge within an organization. Yet, our understanding of what occurs in the initial stages is scarce - that is, the stages during which managers

strategize about why and how to develop and implement such a system. In addition, studies in innovation management rarely explore managers' strategic thinking – their motivations, assumptions, expectations and arguments as they develop a system for innovation. Nevertheless, the introduction of a new technology in an organization is subject to a variety of interpretations, requiring managers to make sense of its purpose and meaning (Walsh 1995; Weick 1995). Moreover, during the decision-making process individuals tend to focus on those aspects and issues deemed most crucial (Ocasio 1997). These interpretations are then significant because they shape managers' choices and actions toward an idea management system. This lack of knowledge is particularly problematic due to the existence of differences in the success of implementation and performance of IMS. In fact, several studies show that many initiatives to implement these systems for innovation fail (Birkinshaw et al. 2011; Dahlander and Piezunka 2014). For instance, this may occur because these systems do not succeed in driving innovation or in fostering employee participation (Van Dijk and Van den Ende 2002; Bjork et al. 2010). We posit that a better understanding of the front-end adoption decision and thus of managers' strategic thinking may help explain the observed inter-firm differences in their implementation and outcomes.

Our study addresses this important issue by investigating the strategic process through which managers shape and implement IMS internally. As such, we study managers' strategic thinking for innovation. We define strategic thinking as the thought processes, both forward-looking and backward-looking (Gavetti and Levinthal 2000), that drive managers' decision to develop, implement and shape their IMS in a specific way. Addressing this issue is crucial for two reasons. First, while most innovation studies focus on the benefits of using IMS to generate innovation from internal sources, we argue that they may tend to discard alternative explanations for why these systems emerge. For instance, research applying an institutional theory lens highlights that the adoption of an innovation or technology within organizations

in many cases is motivated by legitimacy-seeking attributions or by competitive pressures (Teo et al. 2003). The effect of these mechanisms is, however, not taken into account with regard to the implementation of IMS for innovation. Therefore, by focusing on the antecedents of their emergence, we are able to explore which alternative explanations and strategic assumptions may drive managers' decision-making processes. These assumptions may then have an impact on subsequent events and, thus, appear to be important to further understand the set-up process itself and how it unfolds over time. Second, we argue that the development and implementation processes that follow the emergence of IMS entail a variety of considerations, evaluations and strategic choices which may shape these processes differently, depending on how managers allocate their attention (Ocasio 1997). In this way they may determine consequences (intended or unintended) for the outcome. Therefore, we ask: *"How does the strategic thinking and emergence of an idea management system in large organizations impact on its development and implementation?"*

To generate an elaborate understanding and given the limits of extant theory, we conducted a multiple-case study of five large organizations in Denmark. The five organizations have either: (1) recently implemented an IMS with relatively successful and unsuccessful results; or (2) are in their initial phases of developing a new system after a previous unsuccessful experience. We conducted 23 interviews with key innovation and general managers to explore and capture the variation in their strategic thinking related to the system development and implementation across the different organizations. Exploring the antecedents of IMS rather than the outcome enables us to gain a deeper understanding about: (1) managers' main motivations to set up the system; (2) their initial expectations from implementing it; (3) the strategic considerations and assumptions driving the development and implementation processes; and (4) the challenges faced.

Our study offers two contributions. First, we extend existing innovation research by theorizing about why and how managers implement IMS for innovation. Contrary to what current innovation studies argue, we show that generating innovation such as new products, services or processes seems to constitute a secondary motivation in managers' thinking. We identify two alternative explanations for why and how managers implement IMS: legitimacy-seeking and goal-orientation. We suggest that these alternative drivers may challenge more functionalistic explanations for organizing innovation offered by current research. Second, our study shows the importance of incorporating insights from both institutional theory and strategic management literature to better understand the implementation of new technologies for innovation. As current innovation studies seldom investigate managers' decision-making when it comes to innovation, they tend to remain quite disconnected from such logics. Our emerging conceptual model shows how both external and internal drivers and managers' interpretative schemes may influence the way an idea management system is constructed, leading to different patterns and outcomes. In sum, our work has key implications for innovation scholars: focusing solely on the benefits of implementing IMS or on the innovation generated may lead to partial or misleading conclusions about why these systems are implemented and why we observe differences in their performance levels. We provide alternative accounts that may be beneficial to better understand the increasingly important phenomenon of IMS and thus further progress on the domain of organizational research. This is also important in light of the increasing diffusion of new tools and technologies for innovation such as online communities or crowdsourcing platforms. By facilitating cross-functional, IT-enabled innovation, IMS may represent an original approach to link together technology and organization toward "new forms of organizing" (Zammuto et al. 2007; p. 749).

## **2. Theoretical Background**

The majority of studies in innovation focus on the outcomes and performances of, for example, IMS. For instance, several scholars have investigated the effect of contributors' social networks and of individual and work-related factors on the quantity and quality of the ideas generated (Frese et al. 1999; Bjork and Magnusson 2009; Kijkuit and Van den Ende 2010; Bjork et al. 2011). Other studies examine the characteristics of idea submitters (Deichmann and van den Ende 2014) or participants' motivations (Van Dijk and Van den Ende 2002) and their effect on their innovative outputs. On the other hand, limited attention is placed on understanding the process through which IMS are developed and implemented. We know little about managers' motivations, interpretations and expectations toward the adoption of IMS and how these may shape subsequent actions. While these aspects are often neglected and rarely addressed by current innovation literature, we argue that they play a key role in influencing why and how managers implement IMS into their organization. In the following section, we first discuss potential drivers behind the emergence of IMS by drawing on institutional theory. We then outline a number of design issues discussed by innovation literature and their relevance in relation to IMS. We particularly zoom in on aspects of incentive mechanisms, participation architecture and evaluation mechanisms. This brief review of the literature constitutes the starting point for developing our theoretical framework, opening up posing yet unanswered questions.

### **2.1. Rethinking Motivations for Employing IMS**

Over the last decades scholars have investigated the drivers behind the adoption of innovations in organizations. It is argued that "the decision to adopt may have more to do with the institutional environment in which an organization is situated rather than to intra-organizational and technological criteria" (Teo et al. 2003, p. 20). Organizations face a variety of isomorphic pressures to conform to their external environment such as those from suppliers, customers, competitors, professional networks and governmental agencies

(Dimaggio and Powell 1983). Such conformance to institutional pressures provides different benefits to organizations such as legitimacy and prestige as well as access to resources (Dimaggio and Powell 1983; Suchman 1995). Institutional studies distinguish between two types of isomorphism: competitive and institutional. In the case of competitive isomorphism, organizations may decide to adopt practices similar to those of their competitors because of intense competitive pressures (Hannan and Freeman 1977). Institutional isomorphism, on the other hand, is driven by coercive, normative and mimetic pressures rather than by competitive mechanisms (Dimaggio and Powell 1983). Organizations aim at gaining legitimacy in their environment (Dimaggio and Powell 1983; Suchman 1995). Legitimacy can be regarded as “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions” (Suchman 1995, p. 574). Isomorphic pressures may then lead organizations to adopt new technologies or innovations because of their need to be recognized as legitimate and thus as a response to other organizations prompting their adoption (Teo et al. 2003) or because of their fear of losing competitive advantage (Abrahamson and Rosenkopf 1993). However, competitive and institutional pressures are seldom taken into account by innovation studies as potential drivers affecting managers’ decision to implement new technologies for innovation such as IMS.

At the same time, most innovation studies stress the importance of implementing IMS as a tool to generate a continuous inflow of ideas and solutions to feed the front-end of innovation, hence ensuring diversity of inputs. These studies hint that the emergence of IMS is more related to managers’ need to generate innovation, but do not address other potential explanations. As such, the status of this assumption does not allow to develop a more detailed understanding of these systems and their use. Hence, this discussion opens up the question of why IMS emerge.

## **2.2. Designing IMS**

When designing and developing a new system for innovation, managers may be confronted with a different set of strategic choices and alternatives. In this respect, different insights can be derived from the innovation literature in relation to the design of crowdsourcing platforms (Leimeister et al. 2009) or external online ideation systems (Piller and Walcher 2006). A key consideration refers to the design of the system's participation architecture – i.e. the online organizational structure to foster the participation of individual contributors (West and O'Mahony 2008). For instance, a main issue relates to whether participation should be fostered through a structured, problem-solving approach (top-down) or an unstructured idea generation approach (bottom-up). On the one hand, by broadcasting innovation challenges to widely distributed employees, a top-down approach enables to generate solutions to specific problems or organizational issues (Birkinshaw et al. 2011). On the other hand, the bottom-up driven approach plays a crucial role as it allows employees to contribute with unsolicited ideas which may lead to valuable innovations (Bjork et al. 2010). Less clear is, however, how managers think about designing the participation architecture for IMS prior to their development and how they may link both approaches.

Moreover, generating a large number of ideas rarely seems to be problematic. Organizations face the key challenge of how to handle the large amount of inputs generated and, thus, how to move valuable ideas further for implementation (Van de Ven 1986). Relating this discussion to IMS, managers face the challenge of defining proper mechanisms that ensure the evaluation, selection and maturation of the ideas generated (van den Ende et al. 2014). However, little is known about how managers, a priori to implementation and design, think about setting up the selection process – not only in terms of how and when – but also with regard to defining the key actors responsible for such selection and related criteria for decision-making.

Finally, ensuring a high level of employee participation and involvement may represent a crucial issue for innovation. Encouraging and rewarding employees is particularly important in the early phases of the innovation process. Studies on external actors' motivations for engaging in innovation claim that firm recognition (Jeppesen and Frederiksen 2006) and learning experience (Lakhani and von Hippel 2003) influence their participation. Other studies highlight the importance of monetary rewards (Jeppesen and Lakhani 2010), non-monetary rewards (Piller and Walcher 2006) or a combination of the two to encourage the participation of individuals (Poetz and Schreier 2012). However, it is not clear how these various rewards may affect employees' participation and engagement in innovation (van den Ende et al. 2014). Hence, this calls for a better understanding of the type of incentive mechanisms considered by managers when designing IMS.

Overall, we suggest that including these design mechanisms in our discussion is important because managers' motivations and interpretations toward the adoption of IMS may have an influence on how they are designed and developed during the process.

### **3. Method & Data**

Due to the limits of extant research, our study is exploratory and employs a multiple case study research design (Eisenhardt 1989). As multiple cases are grounded on multiple evidence, they are usually claimed to lead to more generalizable findings compared to single cases (Yin 2009). The basic unit of analysis of our cases is the process of emergence of IMS. We studied the design and implementation process of IMS across five large organizations in Denmark and examined managers' strategic thinking. Moreover, our focus is on theory elaboration (Lee et al. 1999) as we aim at further developing theoretical links not fully addressed by research. We attempt to "simplify, reconnect, and redirect theory" (Lee et al. 1999, p. 166) to explain the strategic process through which managers in large organizations

develop and implement IMS. Building on that, our study directs attention to how the design and implementation process unfolds over time and, thus, “provides explanations in terms of the sequence of events leading to an outcome” (Langley 1999, p. 692). Finally, by conducting a cross-case analysis, we aim to capture and study the variation in the design and implementation processes, approaches and strategic assumptions across the different organizations. As such, examining processes across different cases enables to more deeply investigate theoretical ideas (Langley 2013).

### **3.1. Research Setting and Case Studies**

We employed a two-step strategy for the selection of our cases. First, we identified ‘typical cases’ (Miles and Huberman 1994) by selecting large organizations which recently had worked with IMS. The size of an organization constituted an important consideration in the case selection process. We chose large organizations because IMS seek to access and exploit the diversity of their widely distributed employees. Thus, they enable to span various internal boundaries in the search for ideas – hierarchical, functional and geographical. Second, we employed a theoretical sampling approach to select cases which were relevant for our research aim (Eisenhardt 1989). Hence, we selected five organizations constituting ‘polar types’ (Eisenhardt 1989), as they reported contrast (relatively successful and unsuccessful) experiences with the implementation of their IMS. We provided variation in two ways: first, we chose organizations from different industries – thereby offering eclectic settings for studying IMS. Second, we considered cases representing various organizational settings and with different learning loops, as the organizations either (1) had recently developed and implemented an internal IMS with relatively successful and unsuccessful results or (2) are in their initial phases of setting up a new system after a previous unsuccessful experience. In addition, we included the cases of two Danish IM system providers in the analysis to gain additional insights into the set-up process (Langley 1999; Van de Ven 2007). In particular,

we employed the insights generated by these providers to further confirm and augment our findings from the multiple data sources. This especially allowed us to explore how the providers concretely developed and implemented their systems in the client organizations. Table 1 provides an overview of the selected cases.

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

### **3.2. Data Collection**

To gather data we employed an adapted grounded theory approach (Strauss and Corbin 1990). We collected our data from a variety of sources – including semi-structured interviews, archival documents and non-participant observations (Table 2 summarizes the data sources per case). The use of multiple data sources enabled to triangulate our findings and increase construct validity (Yin 2009). Our data set was created between February 2013 and September 2013.

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

*Semi-structured interviews.* We conducted semi-structured interviews with a range of key informants directly involved in the development and implementation of IMS in each case organization. We recruited respondents by using a ‘snowballing technique’ (Lincoln and Guba 1985), in which we relied on our initial contacts to identify additional employees who were knowledgeable about IMS and, thus, could offer additional insights on the topic. Each interview was structured to facilitate within-case as well as subsequent cross-case analyses (Miles and Huberman 1994). Our interview guide included questions developed from our wide initial theoretical framework. We first asked interviewees general questions to understand the organizational context and the role of idea management in their organization. We then proceeded with more focused questions with the aim of exploring managers’ motivations, expectations, considerations and assumptions related to the emergence, design

and implementation of their IMS. Generally two researchers were present at the interviews in order to minimize the single interviewer bias (Bailar et al. 1977). After each interview the two researchers had a brief meeting to discuss interesting emerging insights. The interviews lasted between 30 and 75 minutes, were digitally recorded and subsequently transcribed to ensure reliability (Eisenhardt 1989). Overall, we conducted 23 interviews across the seven organizations, together with several informal conversations with some of the same interviewees (See Appendix 1.1 for the list of recorded interviews and notes). It is important to highlight that we are aware that our data collection may raise the issue of retrospective bias in relation to our interview material, as most data on both decision-making during and after the system development and implementation were collected retroactively from our key informants. However, our decision to collect multiple data sources and to employ multiple researchers during data collection and analysis also aimed at potentially addressing this issue.

***Archival documents.*** We collected different types of internal documents for each case firm – including presentations, fliers and any other relevant material used to promote the system. These documents provided background information about the specific expectations and strategies for IMS as well as disclosed important insights into the main challenges that managers faced during the process. For instance, in one of the organizations we collected slides presentations, which included a timeline of the main events related to their IMS. The presentation contained information about the purpose of developing the system, its performance after the implementation and the main challenges faced during the process. In addition, it provided valuable insights into managers' strategic thinking about how to change and optimize the system. Archival documents thus enabled to augment the findings from the interviews and control for retrospective bias (Ozcan and Eisenhardt 2009).

***Non-participant observations.*** We gathered useful information through informal, non-participant observations during visits to each organization. For instance, one organization

invited us to participate in a three-day workshop on idea management. This workshop focused on developing new business opportunities and aimed at engaging employees from different functions and geographic areas in innovation activities. Also, we organized a one-day workshop at our university on how to best design, develop and implement IMS in large organizations. Representatives from large Nordic organizations as well as some of our key informants had the opportunity to interact and exchange their practice-based knowledge on the topic. During the workshop, we had informal discussions with participants and we developed additional insights from the various organizations. Moreover, we presented our preliminary analyses to some of the key informants and, thus, had the opportunity to collect their insights on them as well as to generate further interpretations. We took detailed notes of our observations and we used them to augment our findings from the other data sources.

### **3.3. Data Analysis**

Our data analysis proceeded in three stages and was iterative. In the first stage, we performed within-case analyses with the aim of developing a deep understanding of each organization in relation to the design and implementation process of IMS. In addition, we followed up with e-mails and calls to gather missing details. We created timelines to describe the key events, activities and considerations related to each phase of the process for each organization (Appendix 1.2). These timeline enabled to develop a better understanding of the sequence of events characterizing the IMS development and implementation processes. We conducted two rounds of coding supported by the NVIVO software. Reading through the interview transcripts, we identified relevant first-order concepts. Some of the first-order concepts were established a priori, based on the framework we developed for our interview guide, while other concepts emerged from the analysis of the interview transcripts. We continuously compared these concepts across interviews and secondary data until no additional information emerged as thus until we reached saturation. In the second stage, we grouped the

first-order concepts into second-order dimensions which represented a more general theme or related to existing theoretical categories (Van Maanen 1979). In the third stage, by using the cross-case analysis techniques suggested by Eisenhardt (1989) and Miles and Huberman (1994), we compared the second-order dimensions across the various cases and interviews. We searched for similar themes and we grouped them into four aggregate dimensions, which constituted the basis for developing our conceptual model. In addition, a third coder was involved in the data analysis process in order to assess the reliability of the generated dimensions and thus ensure trustworthiness (Gioia et al. 2010). The third author provided an outsider's viewpoint "by playing the 'devil's advocate' and offering alternative explanations for developing findings" (Gioia et al. 2010, p. 10). We discussed emerging findings and how they related to the identified dimensions until we reached consensus. We provide evidence of the coding process including the main dimensions and themes with related informants' quotes in Appendixes 1.3 and 1.4.

#### **4. Analysis & Findings**

Our informants described the development and implementation of their IMS as occurring in four broad phases. We identified important differences in managers' strategic thinking and motivations, with various types of assumptions, considerations and choices occurring in the different phases. In particular, we observed that the drivers behind managers' decision to employ an idea management system determined the development of two different evolving trajectories. We labeled these trajectories as 'legitimacy-seeking' and 'goal-orientation'. Table 3 outlines the four identified phases and corresponding trajectories, highlighting the different mechanisms as well as aspects that managers considered most crucial to attend to during each phase. By describing the different phases and corresponding trajectories, we attempt to explain how the strategic thinking and emergence of an idea management system in organizations impact on its development and implementation. We discuss the findings

emerging from the analysis by adopting a narrative approach (Eisenhardt and Graebner 2007), in order to highlight how the development and implementation process unfolded in each organization.

---- Insert Table 3 here ----

### **Phase 1: Realizing the Need for an IMS**

*Internal and external drivers.* We identified various internal and external factors triggering managers' adoption decision. Managers in organizations D and E reported that their decision to employ an IMS was internally-driven. The system responded to their need of lowering the costs of communication across borders and thus of improving collaboration and knowledge sharing among widely distributed employees. In particular, the main purpose was to drive an internal cultural change to build a culture of collaboration and an innovation mind-set across the whole organization,

*“How can we collaborate and communicate and innovate with external partners, fans and customers if we're not even doing it internally? We're a company that has grown very fast in the last few years, we have a lot of new employees, but we also have a lot of people that have been here for 20 plus years... we really needed to create or stimulate a cultural change internally first. A habitual change might be a more appropriate way to call it, internally, if we want to become this open interface that shares and collaborates with everybody outside. So, it makes a lot of sense to, sort of, focus internally to be able to create this cultural shift internally.” (Senior manager open innovation, organization E)*

Conversely, managers in organizations A, B and C were induced to set up an IMS as a response to external pressures coming from competitors, customers and suppliers as well as from external providers prompting their adoption. For instance, intense competitive pressures and the fear of losing competitive advantage in their industry constituted important triggers for managers in organization A,

*“We are in a market that is heavily under...under heavy competition; the auditing market is a very competitive area. So today it's simply not possible to run an auditing company and make a profit by auditing alone; we have to generate a profit else-wise.”(Chief reviser, organization A)*

As such, they considered IMS as a necessary tool to increase the organization's innovative performance in order to be able to compete with other players in the market. This motivated them to benchmark their competitors and adopt similar practices driven by the goal of becoming more innovative. This was important to avoid incurring in losses due to the lack of focus on innovation. Together with external pressures, organizations B and C were also influenced by internal drivers in their adoption decision, where other organizational members prompted the necessity to have a system to handle employees' ideas and thus involve employees in innovation. In this case, managers' aim was to get legitimacy for themselves and the innovation initiative from other organizational members and thus obtain the right legitimate status,

*“They like to think that we have a nice idea management system that you can put in a box and that you can measure and something is being done about it...You need to report this for your shareholders so that they say, oh, the future of this company is secure because we have a formal way of dealing with ideas and managing ideas coming into a system and then progressing through a system.”(Innovation Director, organization B)*

Hence, in organizations B and C managers' adoption decision mainly stem from the necessity to signal a view of the organization as innovative both to the external environment and internally to employees. The increasing number of organizations employing IMS induced them to adopt one as well “to avoid being perceived as less innovative or responsive” (Teo et al. 2013, p. 22). As reported by an idea manager, *“It's something we need to have because everybody else has it”*. As such, managers were more concerned about the negative consequences of not adopting IMS in the eyes of internal and external actors. This is also exemplified by the following quote by a project manager, *“Do you dare to say that in ‘Organization C’ we don't have idea management?”*.

Furthermore, we discovered that the drivers behind managers' decision to implement an IMS led to different patterns of development and implementation and outcomes. More precisely,

we identified two different evolving trajectories. We label the first trajectory ‘Legitimacy-seeking’, where managers considered the search for legitimacy, both externally and internally, as most crucial compared to other drivers (organizations B and C). We label the second trajectory ‘Goal-orientation’, where managers were primarily driven by a specific purpose – i.e. driving an internal cultural change (organizations D and E) or increasing innovative performance to respond to external competitive pressures (organization A). To better highlight these differences, we categorized the purpose driving the adoption of IMS in a matrix (Figure 1), distinguishing between internal and external drivers and corresponding evolving trajectories. This constituted the starting point in our analysis to explain how IMS unfolded in the different organizations in terms of system configuration, implementation and outcome arrived at.

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

## **Phase 2: Designing and Developing the System Configuration**

We noticed that managers differed in their strategic thinking about the design and development of their IMS, especially with regard to incentive mechanisms, participation architecture and evaluation mechanisms. We describe the strategic thinking occurring in this phase by distinguishing between the two identified trajectories.

***Legitimacy-seeking.*** We discovered that the development process was mainly characterized by two key considerations: focus on rapid implementation and conformity to accepted ways of developing IMS. We observed that managers approached IMS without gaining sufficient knowledge and understanding about these systems, being driven by demonstrating short-term results. In fact, the main concern was to have the system implemented and operationalized in the shortest possible time in order to achieve legitimacy for the system and the initiative, hence fulfilling its signaling function. As reported by an Innovation Director,

*“We opened that system in three months...we started having the conversation in June; we continued working over the summer and by September, October we*

*opened the system. So that's July, August, September, October, less than four months, including one month of summer holiday. And that's the way I like to work; I like to get things done."*

As a consequence, managers did not focus on exploring a wide range of alternatives and relied on 'universal templates' (Swanson and Ramiller 1997) for designing the system which were especially suggested by the system provider. Besides, managers mainly viewed IMS in terms of its technical characteristics while discarding instead considerations related to its integration with the existing organizational context to ensure its sustainability. On the one hand, this was reflected in the way managers selected an external system provider. This selection was based on the provider's technical functionalities – which were considered more important than the provision of complementary services – and was the result of a 'rushed' evaluation process. On the other hand, it was reflected in the limited efforts and attention allocated to the design of the system. In fact, we observed that managers neither focused on building a proper incentive structure nor devoted enough effort to properly consider the impact of certain types of incentives. For instance, they decided to build their incentive structure only around monetary rewards as a way to drive employees' behavior as they believed that these rewards were highly visible and valued by employees. This was considered the most obvious choice for them, based either on the provider's advice or on what seemed a familiar approach. This, however, often ended up creating a floating incentive system, leading to undesired consequences in the subsequent phases. This is exemplified by the following quote,

*"The way we said that you would be evaluated on the monthly prize was for the most, highest number of contributions. So now you think; if you incentivize people with volume, then you get volume." (Innovation Director, organization B)*

Managers decided to develop the participation architecture around the collection of unsolicited ideas. However, this decision was not coupled with the design of proper evaluation mechanisms. As the main focus was on gaining legitimacy, the creation of a

process for managing ideas was not regarded as the most important aspect in managers' strategic thinking. The system was then designed as an 'idea box', which sufficed managers' signalling function, while creating challenges in the subsequent phases. Finally, we observed that the limited extent of efforts displayed by managers was also influenced by the non-participative behaviour of top management in these phases, leading to the assignment of limited resources for the development and implementation of the system.

**Goal-orientation.** Managers in organizations A, D and E displayed a different approach to the design and development of their IMS. They considered it crucial to focus on linking the system to current processes to ensure its sustainability. For instance, managers in organization E went through a careful evaluation process to select the right provider that could support the organization driving the desired cultural change,

*“The requirements were for somebody that understands from a 360 [degrees], from a holistic perspective, what it takes to create a cultural change both inside an organization and the way that your customers and your users perceive you as an organization. That’s the reason why we decided to go with the partner that we went with; it’s somebody that brought not only a software solution but somebody who brought a 360 approach to approach to the problem at hand.”(Senior manager open innovation, organization E)*

We observed that these managers tended to search more broadly to identify new ways of designing the system. This entailed exploration of practices adopted by external innovation communities or social media platforms, thereby searching in more distant terrains. In this case, the main concern was to find ways to develop an integrated system ensuring a 'strategic fit' among the design dimensions in order to be able to achieve the main goal. This mainly occurred in three ways. First, these managers decided to develop a point-based reward system and to employ the mechanisms of 'gamification' in the attempt to create an engaging platform (Deterding 2011). This reward system was thought as a way to involve employees in innovation by making participation fun and by recognizing them for their contributions,

*“We all work here with the motto that participation is the new brand loyalty, so what we’re doing is creating a participation experience.”(Senior manager open innovation, organization E)*

They also focused on coupling monetary rewards with the provision of recognition and feedback to further encourage and sustain employees’ participation. Personal and social factors were considered more important than monetary rewards (Birkinshaw et al. 2011). Second, they focused on the principles of openness, collaboration and user-friendliness while designing the participation architecture. User-friendliness was considered crucial to further encourage employees’ engagement,

*“We had to make it so simple that the first step didn't involve that you should spend ten minutes with the check boxes etc. and write a lot. Just come up with an idea, as simple as possible.”(Chief reviser, organization A)*

Different community functionalities were introduced to foster interaction and collaboration. Building a collaborative system was especially important for organizations D and E to foster an innovative and collaborative mind-set among employees. In addition, managers decided to combine top-down and bottom-up approaches from the beginning of the project. The intention was to encourage employees to freely contribute unsolicited ideas and be involved in innovation, while at the same time exploit their knowledge to solve specific issues deemed as relevant by the organization. Finally, managers spent a considerable amount of time and resources setting up proper evaluation mechanisms through the establishment of multiple filtering stages to handle ideas generated with both approaches. The primary strategic considerations during this phase related to: (1) the evaluation process; (2) the choice of the actors responsible for the evaluation; and (3) the definition of specific evaluation criteria.

### **Phase 3: Implementing the System**

It is claimed that, when introducing a new practice in an organization (in this case an IMS), managers’ sense-giving efforts play a key role in creating awareness among employees about the new initiative and its content (Canato et al. 2013). We observed differences in the way

managers approached the implementation phase of their IMS, especially in relation to how extensively they implemented it, the amount of training provided to employees and the level of focus on linking it to the existing practices and processes.

**Legitimacy-seeking.** In this case managers conducted a ‘rushed implementation’ of their IMS. This was reflected in their decision to neglect the creation of a formal implementation plan, hence rushing the system deployment and limiting the amount of testing.

*“It was just: let’s go and do it. We’ll launch on this date and we’ll launch whatever we have, we’ll try to make it the best before this date...I think this is also why it wasn’t thought through that well.”(Commercial Innovation Manager, organization B)*

This, however, resulted in an implementation strategy which did not focus on creating awareness about the system across the organization, thus affecting its subsequent adoption by employees. In fact, managers did not focus on preparing activities to educate and train employees. This was also due to the assumption that, because of the potential benefits for employees of using the system and its ease-of-use, it would have been easily accepted by them. This assumption was also influenced by the external provider’s view of the system as a simple tool to use. Moreover, the implementation of the system was characterized by a “low degree of extensiveness” (Canato et al. 2013, p. 1725) and thus occurred in more localized ways in a specific unit or department.

**Goal-orientation.** Managers considered it important to carefully prepare a formal implementation strategy to foster employees’ understanding about the system. Managers in organizations D and E considered the implementation of the system as the most critical phase. They engaged in intense sense-giving efforts to convince the rest of the organization of the importance and benefits of using it. This entailed the preparation of various communication activities through both online and offline channels as well as the conduction of training initiatives to employees,

*“We created every other Wednesday coaching, training people. If you had questions or if we had questions for the submitter this was the time. We had open hours; a certain hour that we set and we wanted to hear from them”*  
(Coordinator, organization D)

The implementation strategy was conducted more broadly, as the main intention was to address employees across the whole organization in order to foster an internal cultural change. Moreover, these managers focused on gathering resources as well as on intensifying management support by asking, for instance, top management to publicly sustain the initiative. A different situation occurred in organization A. Although managers carefully prepared a detailed implementation plan of the system, they faced challenges during the implementation process due to a lack of resources and management support for the initiative. The fact the top management decided to focus on other priorities deemed as more important prevented them from implementing the system in the intended way, having instead to opt for a more rushed implementation.

#### **Phase 4: Fine-tuning the System**

We observed that managers introduced various corrective actions aiming to adjust and reorient their thinking about both the design and implementation of the system.

*Legitimacy-seeking.* Subsequently to its implementation, managers experienced difficulties in making the system work. In particular, managers realized that: (1) providing monetary incentives alone were not enough to stimulate employee participation; (2) the system that resulted was complex and not easy-to-use for employees; (3) the lack of evaluation mechanisms determined challenges in handling the ideas generated through a bottom-up approach; and (4) the rushed implementation strategy failed to create sufficient understanding of the system among employees. Our informants reported that the system encountered resistance and skepticism from employees as they perceived this initiative to not be consistent with existing organizational structures and practices for innovation.

*“When we researched and interviewed people about how they felt about the system, they felt cheated, that they would send something into a black hole and nothing ever happened.” (Idea manager, organization C)*

As a consequence, managers decided to: (1) change the incentive structure by leveraging social and personal factors rather than monetary rewards; (2) create mechanisms to handle ideas; and (3) improve communication to mitigate employees’ resistance. However, the lack of management support and sufficient resources as well as the unclear ownership of the initiative prevented managers from being effective in their attempts. These difficulties led managers to the decision to: (1) abandon the project (organization B); or (2) change the initial strategy by trying to develop a new system more integrated with existing processes and structures (organization C).

**Goal-orientation.** Managers realized the importance of intensifying their efforts to better integrate the system with the existing structures and processes for innovation. This was to link the system to the broader organizational strategy and to show to employees its value in their daily activities, in this way favoring its sustenance over time.

*“If we can make this a useful tool in employees’ everyday lives, their existing processes, their existing job functions, it’s a great win-win; because we’re getting participation, we’re getting people to adopt the platform and at the same time they’re saving time, they’re actually still doing their job and they don’t perceive it as extra work, it’s just a change in the way they’re doing their jobs. So my job has turned a lot into how...understanding what your job is and what your processes are and how can you use this platform, this tool to help you do your job”. (Senior manager open innovation, organization E)*

In relation to the design of the system, managers introduced a voting mechanism for ideas to further encourage employee involvement by allocating some decision-making authority to them. In order to ensure a strategic linkage of IMS with existing strategies and practices for innovation, managers focused on two key activities. First, they focused on creating collaborations and partnerships with other departments through different meetings and conversations with senior managers and employees. Second, they focused on developing a common language for the system to foster its acceptance across the whole organization. A

partnership with corporate communication and the introduction of specific roles helped develop and communicate such a framework for innovation globally. Organization A saw a different outcome. While managers conceived the system as a necessary tool, the organization was characterized by a strong focus on productivity and short-term results. The introduction of the system thus faced a strong cultural barrier which affected its adoption. The deployment of the system turned out to be problematic due to the division among departments which did not foster any collaborative behavior. By emphasizing ‘the normal way of doing things’, such organizational context did not encourage the sharing of ideas among employees from different departments. This context, coupled with low management support and limited resources, led managers to the decision to suspend the project.

## **5. Discussion**

We set out to explore why and how managers in large organizations set up IMS internally. We found two alternative explanations for why and how IMS emerge: legitimacy-seeking and goal-orientation. As such, these findings suggest a more complex picture on IMS than what previously theorized. Moreover, we identified two key mechanisms that may contribute to explain the trajectory managers undertake and how it unfolds. First, internal and external drivers influenced managers’ implementation decision. Second, managers’ different interpretations and beliefs about the system partly contributed to bias the way it was constructed by them. Another important aspect emerging from our analysis relates to the role of feedback-based processes. We found that the development and implementation process did not occur in a sequential way, rather it was iterative with various learning loops occurring among the different phases, leading managers to adjust their thinking about the system. We thereby build on the previous section to develop and discuss a more comprehensive model of why and how managers set up IMS internally (Figure 2 explained throughout the text), particularly focusing on the role of internal and external drivers, managers’ interpretative

schemes and feedback-based processes. Since the innovation management literature rarely places much emphasis on understanding managers' strategic thinking for innovation, we seek to leverage additional insights from the strategic management literature and institutional theory in order to further interpret our findings and, thus, further theorize about our research question.

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

### **5.1. Implementing IMS: Implications for Innovation Management Research**

Much of the IMS discourse focuses on generating innovation. It is argued that organizations need to collect and mature as many innovative ideas as possible to feed into the traditional innovation process. Current innovation studies tend to emphasize the benefits and positive consequences of implementing IMS to generate innovation, hence giving rise to 'pro-innovation biases' for their implementation (Abrahamson 1991). However, we argue that this tendency to focus on the benefits of implementation as well as to measure the system's success factors based on the number of innovations generated may disregard alternative explanations for why managers actually develop and implement IMS. Our findings suggest that generating innovation seems to constitute a secondary motivation for managers. As such, it was not necessarily because they wanted to generate more and better ideas in the front-end per se that they decided to implement IMS. Often, their decision was triggered by the search for internal and external legitimacy, by the need to create an internal cultural change or by the fear of losing competitive advantage. Hence, these drivers problematize more functionalistic explanations offered by current research. We suggest that trying to assess the success of an IMS based on the innovations produced - in terms of quantity or quality of ideas - is likely to be misleading. In our cases, these systems were not designed by managers with the primary intention to do so. While it may look like a failure on these traditional measures of success, the system may instead satisfy managers' need to signal innovativeness to both the internal

and external environment or to change the internal culture. In this case, it may constitute a success for the proponents. Hence, we suggest the importance of considering alternative accounts when assessing the performance and usage of IMS.

## **5.2. The Role of External and Internal Drivers**

Contrary to what prior innovation studies suggest, our findings reveal greater heterogeneity in managers' motivations when it comes to IMS. We found that both external and internal factors influenced managers' decision to implement IMS. Studies in the institutional field argue that organizations may be influenced in their implementation decision by other organizations adopting the same innovation as this may lead to a "bandwagon pressure" (Abrahamson and Rosenkopf 1993). Thus, their adoption decision is not driven by "their individual assessments of an innovation's efficiency or returns" (Abrahamson and Rosenkopf 1993, p. 488). Arguably, as IMS have received increasing attention and popularity, managers face the strategic imperative prompted by the internal and external environment of being continuously innovative and of involving employees in setting strategies for innovation through IMS. This may, however, create some ambiguities in relation to the use of these systems, their implications for organizations and how to respond to such pressures. In our cases, managers' decision was driven by the fear of appearing less innovative internally and externally rather than by a real adoption need. This led them to engage in isomorphic actions and thus to employ IMS as this constituted "the most easily available solution to the problem posed by that threat" (George et al. 2006, p. 355). At the same time, we found that managers' search for internal and external legitimacy resulted in a lack of strategic direction and clarity about the purpose of employing such a system internally. This created a mismatch of expectations, as the nature and use of IMS differed from managers' initial expectations. This mismatch may be traced back to the different beliefs of managers and employees. For instance, while employees initially expected the system to be a tool to help them develop and

move their innovative ideas further, the fact that the system was not designed and implemented to support such purpose determined consequences on the way employees perceived its value. One explanation may be that while managers wanted a system providing external and internal legitimacy, they translated their expectations to employees via a rational strategic, competitive-based discourse. This mainly occurred because it was not considered socially acceptable to communicate that they wanted to conform to isomorphic pressures. The mismatch created a tension between what managers actually wanted and what employees thought they wanted.

Moreover, external competitive pressures constituted another important driver in managers' implementation decision. According to Abrahamson and Rosenkopf (1993, p. 492), an organization may tend to "avoid the worst-case scenario of being at a competitive disadvantage by performing below the average performance of organizations in the collectivity". This may explain why managers in organization A considered the need to develop an innovation strategy through IMS as crucial. Finally, our findings seem to suggest that internally-propelled movements for cultural change were associated with more successful efforts to implement IMS compared to the other cases. This may be explained by the fact that IMS responded to a real adoption need and thus was considered by managers as a valuable mean to achieve their purpose. At the same time, differently from the other cases, such initiative was championed and supported by top management since the beginning. Overall, while many studies tend to focus on the effect of external pressures on innovation adoption (Teo et al. 2003), we suggest the importance of also considering internal drivers, an aspect which has received less attention. Our findings indicate that both drivers may play a key role in the implementation of new technologies for innovation such as IMS.

Building on this, we observed that these drivers contributed to shape managers' beliefs and interpretations about their IMS biasing how it was designed and implemented. Relatedly, it is argued that managers' motivations not only influence the adoption of a new innovation or technology, but also how it is implemented (Gosain 2004) as well as how extensive managers are in their implementation efforts (Kennedy and Fiss 2009).

### **5.3. The Role of Managers' Beliefs and Interpretations**

Strategic management studies argue that managers' 'interpretative schemes' influence their strategic choices and decisions (Gavetti 2005; Gavetti and Rivkin 2007) and how they interpret organizational phenomena (Orlikowski and Gash 1994). They tend to influence their thought processes during decision-making, including "what information to attend to and how to interpret that information" (Griffith and Northcraft 1996, p. 100). This was evident in our cases, where managers focused on those drivers, internal and external, perceived as most crucial. At the same time, they led to the development of different understandings of the system itself, shaping managers' subsequent choices and activities. More precisely, our analysis suggests the existence of two different types of interpretative schemes underlying IMS adoption and implementation, namely: (1) *IMS as an IT system*; and (2) *IMS as a valuable tool to achieve a goal*.

***IMS as an IT system.*** Our findings suggest that managers viewed their IMS in a simplified way, as an IT system. They interpreted it as a quick technological solution that could easily be implemented, thus fulfilling its signaling function. Such simplified view led managers to rely on 'universal templates' embedded in the organizing vision prompted by the external environment (Swanson and Ramiller 1997). The organizing vision provides a simplified way of a new technology or innovation and general guidelines for its implementation (Swanson and Ramiller 2004). As such, "it economizes on the implementation process as basic parameters are set automatically" (Benders et al. 2006, p. 199). We observed that the external

provider played a significant role in this simplification process, emphasizing a view of the system as easy to implement and utilize. Moreover, we observed that managers relied on heuristics to understand and justify their choices (Gavetti and Rivkin 2007). For instance, to justify the system implementation managers used the argument ‘everyone has it’ or ‘we need to be more innovative’. Hence, managers justified their decision based on the activities of other firms. Moreover, the fact of relying on the ‘organizing vision’ led managers to ignore the importance of the organizational context (Swanson and Ramiller 2004). In general, we suggest that the lack of careful consideration about the system design and implementation may be due to managers displaying a *short-term orientation* toward IMS. As such, managers tended to only consider the first alternative available (March and Simon 1958), leading to the risk of disregarding potentially better alternatives (Schwenk 1984). This was also due to time pressure constraints, which led managers to disregard important dimensions of the development and implementation process – deemed non-relevant or obvious - or to only superficially consider them. Consequently, this orientation prevented managers from building the organizational capability necessary to sustain such an innovation initiative in the long-term. This led to a somewhat more ‘ceremonial’ implementation of IMS – i.e. the system was formally implemented but not integrated with existing structures and processes for innovation (Meyer and Rowan 1977). As such, it was used only for signaling reasons but not to drive innovation in the organization.

***IMS as a valuable tool to achieve a goal.*** Managers viewed IMS as a process of continuous shaping, learning and improvement. They developed more positive beliefs about its value to achieve the desired goal, influencing their subsequent behavior. As stated by Kostova and Roth (2002, p. 217), “these positive perceptions about the value of a practice are important because of their action-generating properties that facilitate not only the initial adoption but also its persistence over time”. We observed that managers displayed high levels of effort and

persistence as well as a *long-term orientation* in their strategic thinking. This is claimed to be important because it may allow managers during decision-making to “more fully notice, interpret, and make sense of new knowledge and potential opportunities” (Li et al. 2013, p. 900). By focusing on integrating technological and organizational considerations as well as on finding ways to link the system to the broader organizational strategy for innovation, this long-term orientation led managers to view IMS in more holistic manners. As such, managers’ strategic choices, in terms of which aspects to attend to and which not, were driven by context-oriented considerations (Swanson and Ramiller 2004).

#### **5.4. Feedback-based Processes: Re-interpreting Failure as Success**

Our findings reveal that IMS were conceived as a ‘trial and error’ or ‘learning on the way’ process (Gavetti and Levinthal 2000). In fact, managers adjusted their thinking about the system along the process and made corrections deemed to be relevant. In some cases the failure with the first system constituted a learning experience about what worked and what did not as well as about mistakes made. We thus found different learning loops in our study where managers learned from their previous unsuccessful experience, from themselves and their organization and from the external environment and, consequently, tried to incorporate this learning into the development of a new system or into the improvement of an existing one. In this respect, feedback-based, experiential learning constitutes a form of “backward-looking wisdom” (Gavetti and Levinthal 2000, p. 114), where choices are made and - depending on their outcomes - subsequent adjustments may be introduced. We suggest that IMS evolve over time and, as such, it takes time to make them operational and integrated with the rest of the organization. Thus, they may not yield useful inputs to innovation right from the start. Integrating such systems requires managers to continuously revise the set-up process and to be able to respond to feedback by introducing corrective actions. An important aspect emerging from our study is that managers can play an important role in diverting the

trajectory they undertake through the learning processes and corrective actions they experience. It is argued that training and experience may help improve managers' cognitive capabilities (Helfat and Peteraf 2014). For instance, we noticed that the initial failure experience led some managers to divert from the initial templates and 'one-size-fits-all' interpretation of the system toward more customized approaches. By making managers search in different directions, these iterations may be seen as a way to break away from the 'natural' trajectory. Hence, a key contribution of this study is to re-interpret failure as success by showing that in some cases 'failures' succeeded in signaling to managers which corrective actions to take. We suggest that this important aspect requires further investigation.

### **5.5. Organizing Innovation through IMS**

While placing emphasis on the importance of expanding the sources of innovation beyond organizational boundaries, we argue that current research tends to ignore organizations' internal search activities and the opportunities to access a broader diversity of knowledge and competences held by their widely distributed employees. A broader implication of our study lies in the consideration that employing IMS internally may constitute an important precursor of open innovation (Chesbrough 2003). By expanding the internal search for ideas and solutions, these systems may represent an important tool to support and organize IT-enabled innovation in large organizations. Relatedly, considerations about the design and implementation of these systems become significant in order to understand how to better organize innovation activities internally as well as how to fully exploit the collective intelligence of distributed employees. In this respect, designing IMS for innovation raises a number of challenges for managers similar to those described by current innovation literature. In particular, the design of a proper incentive system, participation architecture and evaluation mechanisms appear to be crucial. Moreover, resources and management support constitute two key contextual aspects to be taken into account. In fact, we suggest that

without proper mobilization of resources and management support, IMS would hardly function in the long-term. Overall, the above discussion leads to the argument that, when designing IMS for innovation, managers need to consider how to achieve a ‘strategic fit’ among the various dimensions of IMS to reach the desired outcome. The importance of achieving a strategic fit is, however, not emphasized by current research. Because idea management studies have focused on the outcome of these systems, organizations tend to see the positive consequences of employing them, while failing to think about strategic fit in the development and implementation processes.

## **6. Conclusion**

The purpose of this study was to explore why and how managers in large organizations set up IMS for innovation internally. Our study contributes to current innovation management research by identifying two alternative explanations for why and how IMS emerge: legitimacy-seeking and goal-orientation. Building on this, we suggest that our findings may have broader implications for organizational research. We show the important influence of internal and external drivers and managers’ interpretative schemes on the way IMS are shaped. Hence, incorporating insights from both institutional theory and strategic management literature may provide a more detailed understanding of the implementation and use of new technologies for innovation. We suggest that such integration is important as it enables to analyze the adoption and implementation of new technologies for innovation both from a macro and micro perspective, by linking internal and external drivers to managers’ interpretations and subsequent choices and actions. It may also contribute to better explain the observed inter-firm differences in their implementation and outcomes. Besides, we contribute to current research by shedding more light on the process of developing and implementing IMS rather than focusing on the outcome. Such a process perspective enables to capture the variation in managers’ strategic thinking and assumptions driving the set-up of

these systems. We argue that this variance becomes hidden when only looking at their outcome.

Moreover, our findings hold implications for both practitioners and system providers. Practitioners who are in their initial phases of developing a new IMS or already have implemented one may apply the proposed model as a tool to direct and improve their decision-making process. We highlighted key aspects related to the design, development and implementation of IMS which should be carefully considered by them. In addition, we suggest that practitioners should be aware that setting up IMS require: (1) mindful decision-making (Swanson and Ramiller 2004), thus making choices that best fit with the organizational context; and (2) a long-term perspective, thereby conceiving IMS as a continuous learning process to change and optimize it over time. Yet, system providers may consider our study as a supporting tool for understanding how to develop a customized IMS which fulfils their specific customer needs.

The limitations of this study suggest opportunities for future research. First, it could be interesting to test whether our emerging conceptual model may be extended to other organizational settings. Moreover, future research may benefit from undertaking a larger-scale longitudinal study by conducting surveys to observe the development and implementation process over time. Second, the study could also be extended by investigating differences in interpretations and beliefs underlying IMS developed by other key actors, such as employees or external providers. This could lead to a better understanding of whether differences in key actors' interpretations may influence the system subsequent evolution and performance. Third, we are aware of the limitations in terms of retrospective bias on the interview material, which may shape the way interviewees presented their views on IMS. However, recurring into these biases is inevitable. One way to circumvent this could be, for

instance, to involve managers in experimental settings to test their beliefs, interpretations and arguments about how to develop and implement IMS and why. Finally, more research needs to be done on understanding the interplay between managers' interpretative schemes, institutional pressures and economic incentives in the setting up of IMS. By adopting a broader approach, our study attempted to take a step forward in this direction.

In general, further understanding how IMS are implemented and employed in organizations constitutes an important area for future research. Their increasingly open and interactive nature may transform the dynamics of search within organizations, by expanding the possibilities to access the collective intelligence of distributed individuals and communities. Our study contributes by offering a more detailed understanding of this increasingly important phenomenon.

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**Table 1. Overview of Cases**

Case	Industry	Type of industry	Number of employees (2012)	Size by revenue (2012)	IMS			
					Period	Platform	Scope	Outcome
A	Auditing and Consulting	B2C	55,000	DKK 4,630 million	Fall 2011 - Fall 2013	Internal	Local	The first system has been suspended.
B	Manufacturing	B2C	18,000	DKK 63,114 million	Spring 2010 - Spring 2012	External	Local	The first system was closed; a new version of the system was developed, but not implemented.
C	Mechanical engineering	B2B	16,000	DKK 24,000 million	2003- Fall 2013	External	Local	The first system will be closed. C is in the initial stages of developing a new system.
D	Electronics and Engineering	B2B	360,000	DKK 78,296 million	1996 - present	Internal	Global	Positive performance of the first system. However, it will be substituted by a new version purchased from an external provider.
E	Manufacturing	B2C	10,000	DKK 23,405 million	Fall 2012 - present	External	Global	Positive performance of the first system. Focus on improving the system.

**Table 2. Data Sources**

<b>Organization</b>	<b>Interviews (a)</b>	<b>Archival documents (b)</b>	<b>Observations</b>
Organization A	IT senior managers (2): responsible for the development and implementation of the system; Active users of the system (2); Administrator of the system (1)	Documentation about the system Marketing material	Informal visits to the office (2) Participation to a meeting about the system. One-day workshop on idea management.
Organization B	Director (1), Innovation managers (2): responsible for the development and implementation of the system; Active user of the system (1); Senior Vice-president R&D (1): current owner of the system	Internal marketing material about the system (posters, fliers, slides) Documentation about the system	One-day workshop on idea management
Organization C	Idea Manager (2): responsible for the development of the new system; Facilitators (3); User of the system (1); Senior Vice-President (1)	Internal marketing material about the system Documentation - the old system Documentation - the new system Documentation - the workshop	Participation to an internal idea management workshop (3 days); Informal visits to the office
Organization D	Program Manager (1): responsible for the development and implementation of the system; Coordinator (1).	Internal marketing material on the system	One-day workshop Informal visits to the office
Organization E	Senior Manager Open Innovation (1): responsible for the design and implementation of the system	Documentation on the system	One-day workshop Informal visits to the office (2)
Provider A	CEO (2): responsible for the design and development of the system	Documentation about the system Marketing material Articles about the system written by the one two founders.	Informal visits to the office
Provider B	Director (1): responsible for the development of the system	Documentation about the system Marketing material	Informal visits to the office

a. This column summarizes the number of informants interviewed and their roles within their organization.  
b. This column summarizes the types of archival documents collected for each organization.

**Table 3. IMS Phases and Corresponding Trajectories**

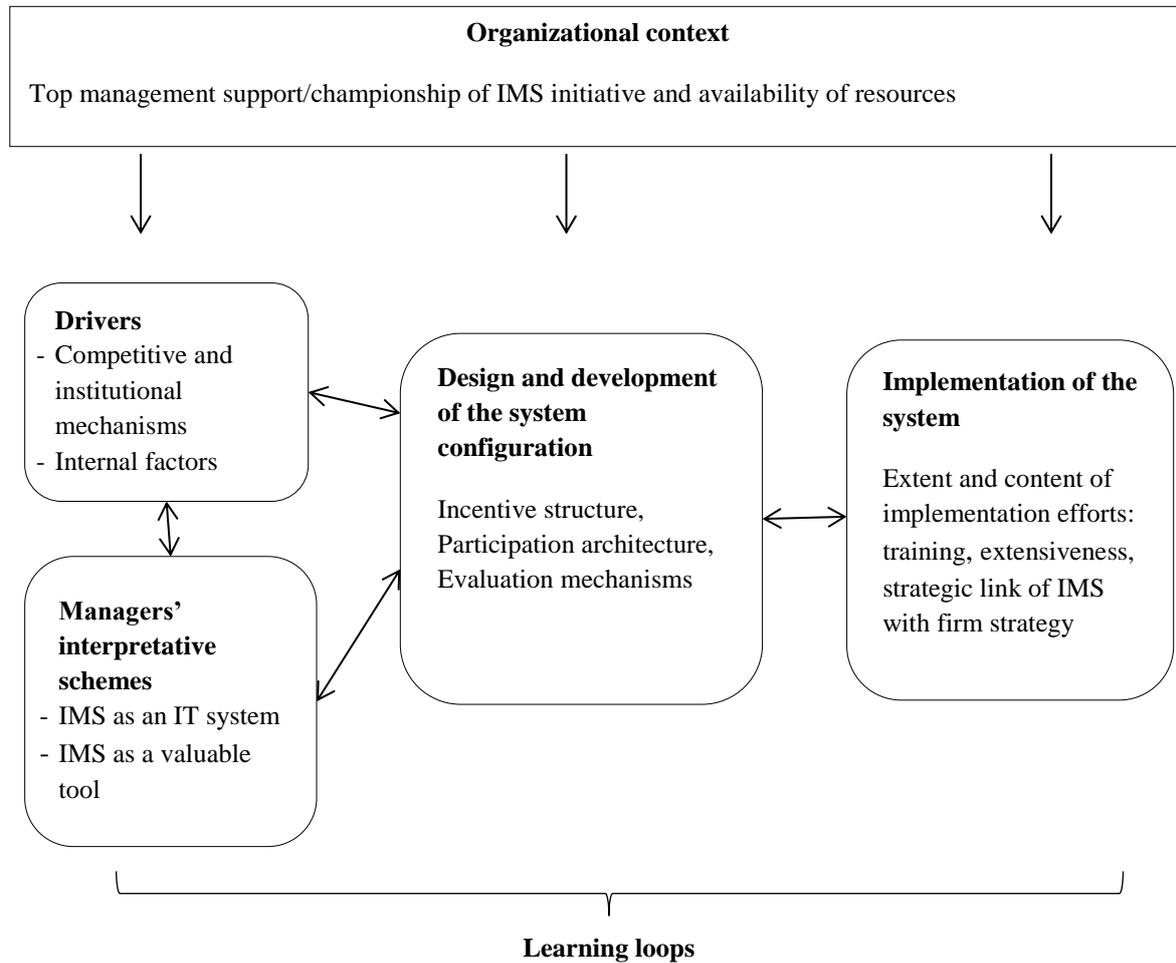
Phase	Legitimacy-seeking trajectory	Goal-directed trajectory
<p>Phase 1: Realizing the Need for an IMS</p>	<p><i>Comply with isomorphic pressures.</i> The main driver for these managers was to gain external legitimacy</p> <p><i>Search for internal legitimacy.</i> Gain consent for the new innovation initiative from employees.</p>	<p><i>Employ IMS to achieve a specific purpose.</i></p> <p>1) <i>Create an internal cultural change.</i> The main concern for these managers was to foster collaboration and an innovation mindset among employees.</p> <p>2) <i>A new innovation initiative is needed to avoid losing competitive advantage</i></p>
<p>Phase 2: Designing and Developing the System Configuration</p>	<p><i>Short-term orientation and efficiency considerations.</i> The main belief was to have the system designed and operationalized in the shortest possible time, to signal innovativeness both internally and externally.</p> <p><i>Focus on the technology.</i> Reliance on providers' advice or internal technical staff for the design of the system. Limited search for information and evaluation of alternatives, mainly occurring in the neighborhood of the organization. Limited efforts in the design of the system functionalities (incentive mechanisms, participation architecture and evaluation mechanisms).</p>	<p><i>Focus on employee engagement and participation (Organizations A, D and E).</i> View of the system in strategic and organizational terms. The intention was to develop a 'strategic fit' among the design dimensions, by coupling the design of the incentives structure with participation architecture and evaluation mechanisms. High intensity of efforts and broad exploration for new alternatives.</p> <p><i>Focus on gathering management support and resources (Organizations D and E).</i> Importance of involving top management from the beginning.</p>
<p>Phase 3: Implementing the System</p>	<p><i>Rush the implementation.</i> Focus on launching the system in the shortest possible time. The creation of a proper implementation strategy was neglected or only superficially considered.</p> <p><i>Low sense-giving efforts.</i> Managers' assumption of the system implementation and adoption process as easy led them to omit communication and training initiatives.</p> <p><i>Underestimation</i> of the amount of resources needed and low efforts in gathering management support.</p>	<p>Organizations D and E: <i>Create a proper implementation strategy.</i> This was considered crucial to foster employees' understanding about the system and gain acceptance.</p> <p><i>Intense sense-giving efforts.</i> Intense communication and training initiatives to foster employees' understanding.</p> <p><i>High extensiveness of the strategy.</i> All employees across the organizations were addressed.</p> <p><i>Focus on linking the system with the firm strategy and processes for innovation.</i></p> <hr/> <p>Organization A: <i>Limited communication of the IMS initiative.</i> Top management does not consider the initiative as a priority and limited resources are assigned to its implementation. Only a limited implementation is conducted.</p>

Phase 4: Fine-tuning the System	<p><i>Reorientation of the system configuration.</i> Focus on improving the incentives structure, participation architecture and evaluation mechanisms.</p> <p><i>Improve sense-giving.</i> Increase communication initiatives to mitigate employees' resistance and foster understanding.</p> <p><i>Focus on gathering management support and resources.</i> Managers attempted to gather necessary support and resources to sustain the initiative.</p>	<p><i>Organizations D and E. Intensify the integration strategy.</i> Further increase sense-giving efforts to show how the system fits existing practices. Partnerships and collaborations with different departments. Focus on developing a common language for the system.</p> <p><i>Retention of working concepts and re-configuration of the system.</i> Some improvements were made on the different design mechanisms and some changes were introduced.</p> <p><i>Intensify management support.</i> Focus on increasing management involvement in the promotion of the system to further foster acceptance. Increase allocation of resources.</p>
Outcome	Abandonment (organization B). Suspension of the project and idea to develop a new system (organization C)	Positive performance (organizations D and E). Low usage of the system due to cultural barriers. The project is suspended due to other priorities of top management. (organization A)

**Figure 1. Purpose Driving the Adoption of IMS**

		<b>Evolving trajectory</b>	
		Legitimacy-seeking	Goal-orientation
<b>Drivers for IMS implementation decision</b>	External	<b>Conform to isomorphic pressures</b> Organizations B, C	<b>Respond to competitive pressures</b> Organization A
	Internal	<b>Internal search for legitimacy</b> Organizations B, C	<b>Create a cultural change</b> Organizations D, E

**Figure 2. A More Comprehensive Model of IMS Adoption and Implementation**



## Appendix

### 1.1. List of Interviewees

N.	Company	Job Title	Roles related to IMS	Time	Data Collection
1	Provider B	Consultant/Partner	Design + Development	1h 15 min	Face-to face interview; Recorded; One Interviewer
2	Provider B	Consultant/Partner	Design + Development	1 h 05 min	Face-to-face interview; Recorded; One interviewer
3	Organization A	Auditor	User of the system	41 min	Phone interview; Recorded; One interviewer
4	Organization A	Senior IT management advisor	Design, Development and Implementation	1 h 06 min	Informal conversations, face-to face interview; Recorded; One interviewer
5	Organization A	Business Development Consultant	Administrator	30 min	Phone interview; Recorded; One interviewer
6	Organization A	Chief Revisor	Design, Development and Implementation	1 h 11 min	Face-to-face interview; Recorded; One interviewer
7	Organization A	Auditor	Active user of the system	37 min	Face-to-face interview; Recorded; One interviewer
8	Organization B	Commercial Innovation Director	Design, Development and Implementation	51 min	Face-to-face interview; Recorded; Two interviewers
9	Organization B	Business Development Consultant	Implementation, Maintenance	45 min	Face-to-face interview; Recorded; Two interviewers
10	Organization B	Commercial Innovation Manager	Design, Development and Implementation	52 min	Face-to-face interview; Recorded; Two interviewers
11	Organization C	Idea Manager	Design, Development and Implementation	52 min	Face-to-face interview; Recorded; Two interviewers
12	Provider A	Partner & Director	Design, Development and Implementation	1 h 5 min	Face-to-face interview; Recorded; Two interviewers
13	Organization D	Program manager	Development and Implementation	1 h	Face-to-face interview; Recorded; One interviewer
14	Organization B	Senior Vice President R&D	Ownership of the new system version	20 min	Phone interview; Recorded; Two interviewers
15	Organization E	Senior Manager Open Innovation	Design, Development and Implementation	50 min	Phone interview; Recorded; One interviewer;
16	Organization B	Customer Service Manager	User of the system	/	Online interview, written answers.

17	Organization D	Coordinator	Coordinator	45 min	Face-to-face interview; Recorded; One interviewer
18	Organization C	D&E Strategy Assistant, Global Projects and Planning	Facilitator of the previous system	45 min	Face-to-face interview; Recorded; Two interviewers
19	Organization C	Chief Engineer	User of the old platform	/	Face-to-face interview; Notes; Two interviewers
20	Organization C	Idea Manager	Decision Maker/Owner of the previous system as well as the new one	40 min	Face-to-face interview; Recorded; Two interviewers
21	Organization C	Group Vice President	Decision Maker	41 min	Face-to-face interview; Recorded; Two interviewers
22	Organization C	Project Manager	Responsible for the old platform, facilitator	1 h	Face-to-face interview; Recorded; Two interviewers
23	Organization C	Senior system architect	Founder of the previous system	43 min	Face-to-face interview; Recorded; Two interviewers

## 1.2. Timelines

Each timeline describes the emergence, development and implementation process of IMS within each organization.

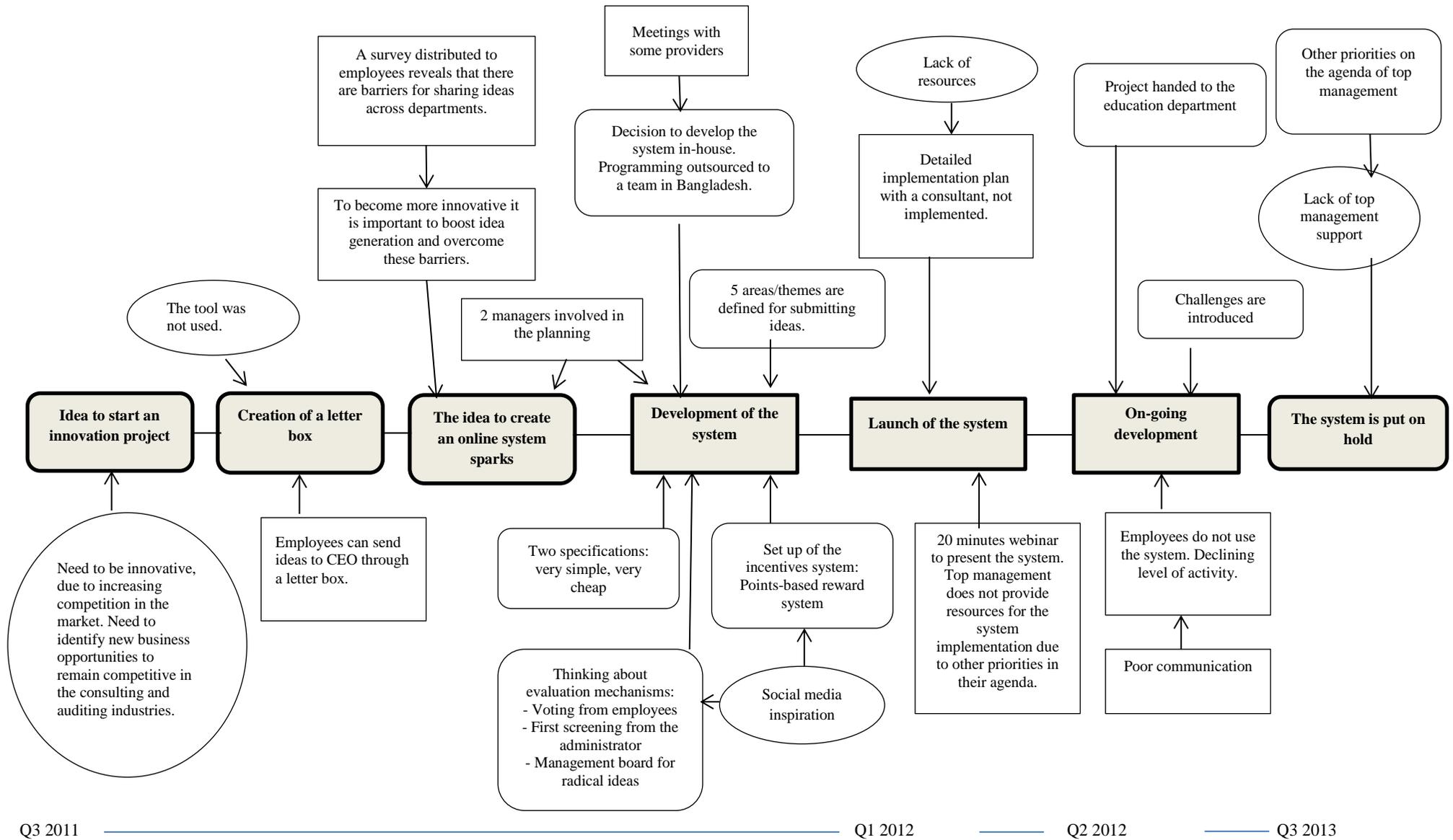
*Boxes.* Following Langley (1994), the boxes shown on the timelines contain descriptions of the key aspects characterizing the IMS process. Oval boxes represent 'events', round-cornered rectangles represent 'choices' made by managers, sharp-cornered rectangles represent 'activities' carried out by managers or other members in the organization (Langley 1994).

*Arrows.* The arrows show how specific events, choices and activities influence the IMS process.

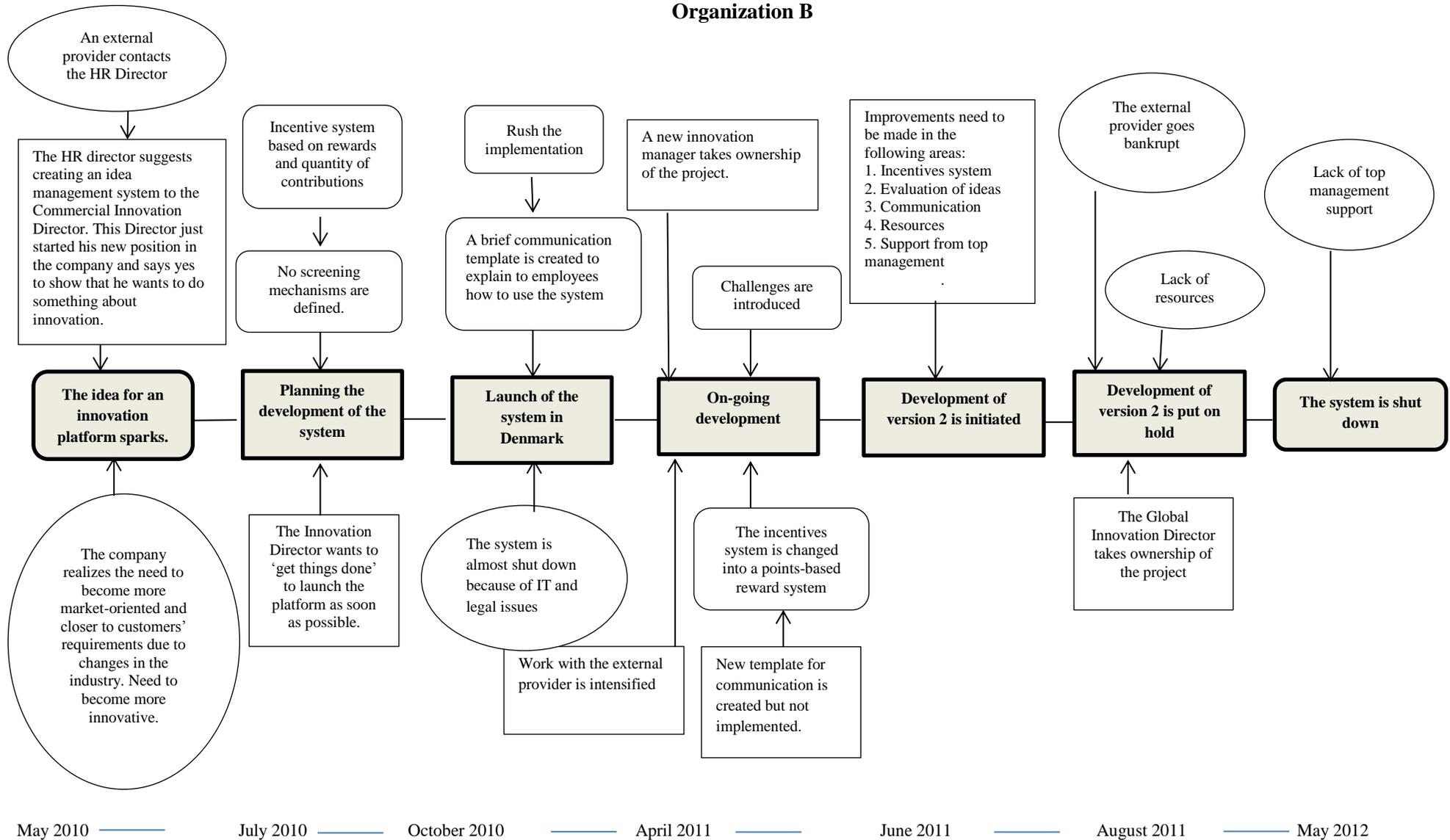
*Time.* The time scale aims to provide a more comprehensible view of the sequence of events.

However, it is important to highlight that this time scale is represented in a simplified way to provide a better understanding of the temporal order of key events, choices and activities.

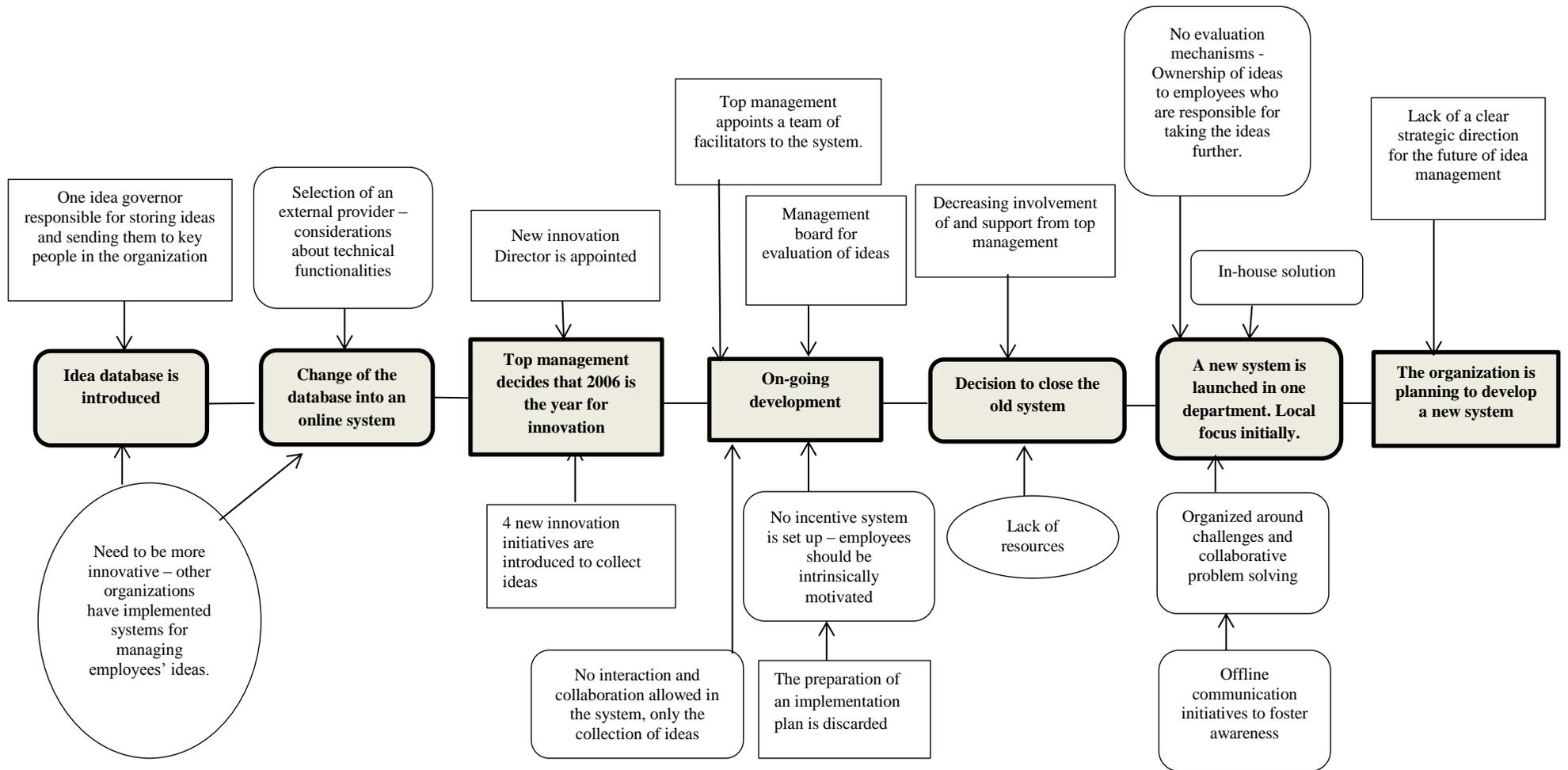
## Organization A



## Organization B



## Organization C

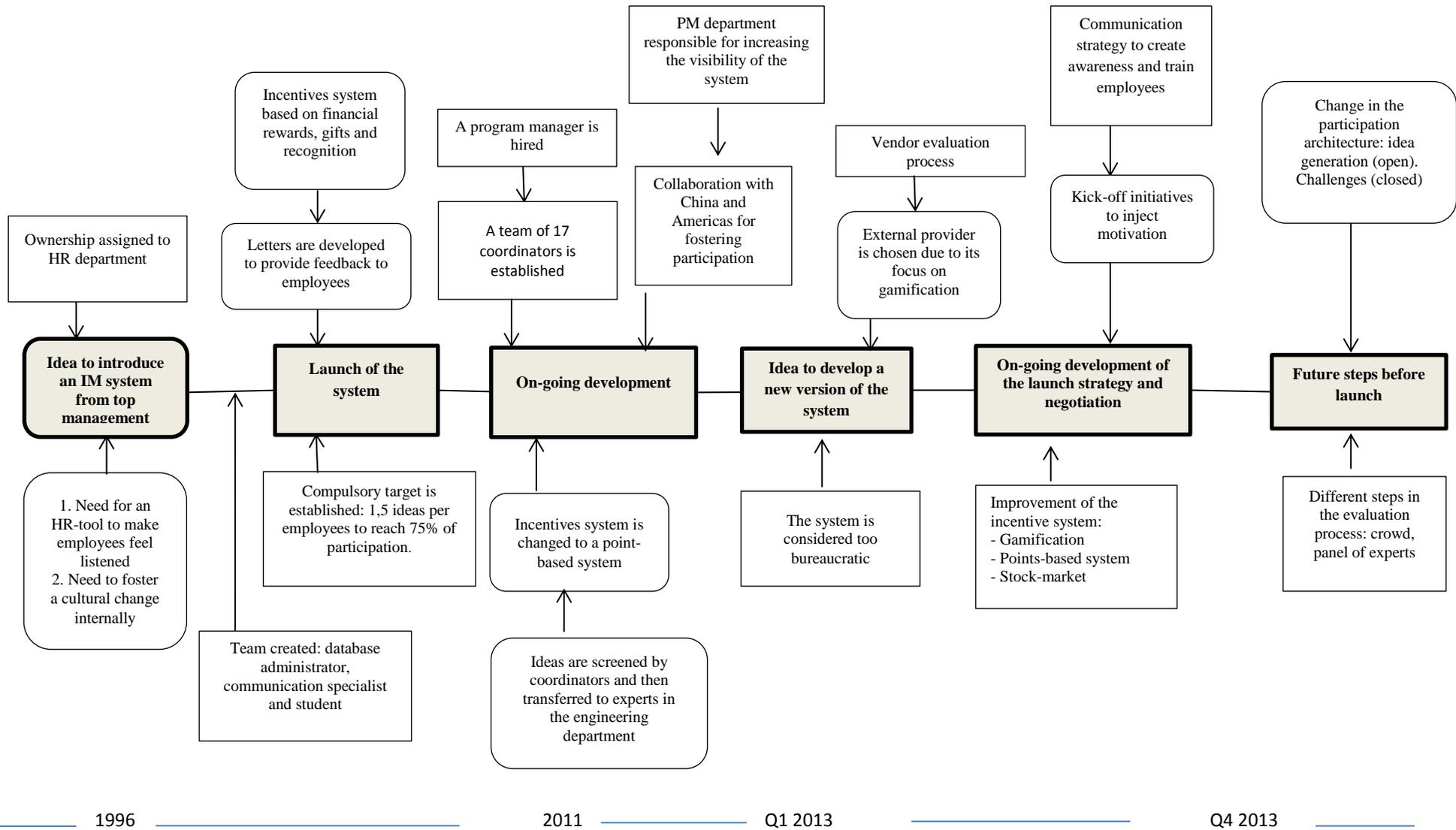


2003

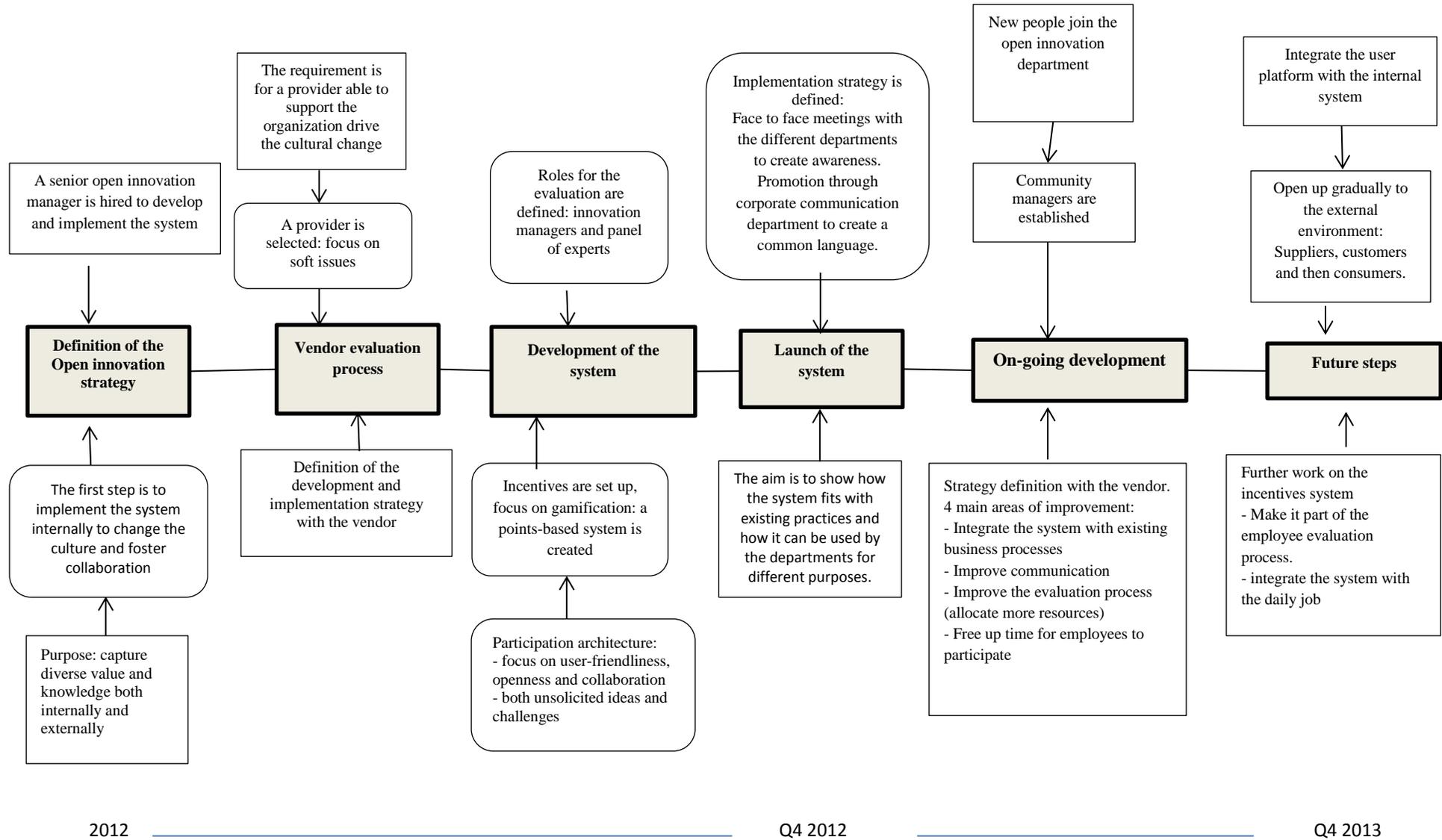
2006

Q1 2013

## Organization D



## Organization E



### 1.3. Dimensions, Themes, Categories and Data

<b>2<sup>nd</sup> order dimensions and 1<sup>st</sup> order informant concepts</b>	<b>Representative Data</b>	
<b>Phase 1: Realizing the need for an IMS</b>		
<b>Isomorphic Pressures</b>	<p><i>“There's a lack of clarity on the purpose of the system. So top management has a thing, oh, we need to be more innovative. We need everybody enrolled in innovation. And then they get somebody three or four levels down the system to implement it and it's a complete mismatch. There aren't clear reasons for why they're doing it.” (Commercial Innovation Director)</i></p>	Organization B
	<p><i>“The primary purpose of this thing was to speed up innovation within the whole of ‘Organization B’. There are many reasons to that, mainly because we’re too slow to the market...recently – the last ten years – there’s been a shift towards the consumer and the market, what are their actual needs?” (Business Development Consultant)</i></p>	Organization B
	<p><i>“So I think it was also, you could say that it was in the time that there was a lot of focus on innovation, so it was the new buzz word at that time. Year of Innovation, 2006, a lot of things happened at that time so it was just a natural thing to do at the time.” (Project manager)</i></p>	Organization C
	<p><i>“It’s something we need to have because everybody else has it....” (Idea Manager)</i></p>	Organization C
	<p><i>“There were a lot of tools developed, like I think it was called xxx as a tool, there was a tool box created and there was also a focus on the innovation platforms. They were also pointed out from that time, the three innovation platforms – two or three”. (D&amp;E Strategy Assistant)</i></p>	Organization C
<b>Competitive Pressures</b>	<p><i>“We are in a market that is heavily under... competition; the auditing market is a very competitive area. So today it is simply not possible to run an auditing company and make a profit by auditing alone: we have to generate a profit else-wise.” (Senior IT Management Advisor)</i></p>	Organization A
	<p><i>“We can share ideas in the organization, across the organization and we have to innovate to build up this business, else we are going old and dusty.” (Auditor)</i></p>	Organization A
	<p><i>“So we need to be aware of new business opportunities, either within the core business, or also completely new opportunities where we will develop new kinds of business, you could say. So for that we needed some way to manage that in a more structured way than we used to and we also wanted to have a place where you could... where we could build on each other’s strengths and competencies” (Senior IT Management Advisor)</i></p>	Organization A
	<p><i>“We need innovation in our business, because people always say, innovation and auditors, they don't compare, because people see auditors and audit companies as a... you have to see if something is compliant to the law, taxation and book-keeping etc...but in fact, we are in a business that is always in consultancy and the audit part is going down and consultancy is going up. If we have to invent what we would make our living from tomorrow, it has to be consultancy, so we have to be innovative”(Chief reviser)</i></p>	Organization A
	<p><i>“I think their number one problem is that market's going down, customers will stop, prices are going down. We have to cut spending, cut down project etc. They don't see the, what do you call, the burning platform. So if we don't want to just have our revenue going down, we have to be innovative”. (Auditor)</i></p>	Organization A
<b>Create a Cultural Change</b>	<p><i>“When you are implementing it you’re getting much more than that; you’re getting a tool to change the culture inside your company, to change a lot of the processes internally in the company and how much value that has.” (Senior Manager Open Innovation)</i></p>	Organization E

	<i>“A lot of projects that happen within the different departments...and there’s a lot of wealth of knowledge and learning and very valuable things that ... were learned along the way they disappear ... there is no place to continue the collaboration and the platform is probably the best way to capture all of this value and knowledge.” (Senior Manager Open Innovation)</i>	Organization E
	<i>“How can we collaborate and communicate and innovate with external partners and fans and customers if we’re not even doing it internally? We’re a company that has grown very fast in the last few years, we have a lot of new employees, but we also have a lot of people that have been here for 20 plus years...and we really needed to create or stimulate a cultural change internally first. A habitual change might be a more appropriate way to call it, internally, if we want to become this open interface that shares and collaborates with everybody outside. So, it makes a lot of sense to, sort of, focus internally, to be able to create this cultural shift internally” (Senior Manager Open Innovation)</i>	Organization E
	<i>“This is an HR tool to make sure that people on the factory floor can be heard so that their ideas can be heard” (Coordinator)</i>	Organization D
	<i>“I care about culture, so that’s really what we want to be doing”(Program manager)</i>	Organization D
	<i>“It’s necessary, it’s necessary to educate people. Knowledge is something you always have to share in a company and sharing knowledge is very important. Knowledge is not intended to be hidden and if you can educate people, then it’s a beautiful thing to do” (Coordinator)</i>	Organization D
<b>Search for Internal Legitimacy</b>	<i>“So if you talk to people at quite senior positions, then they like to think that we have a nice idea management system that you can put in a box and that you can measure and something is being done about it. You need to report this for your shareholders so that they say, oh, the future of this company is secure because we have formal way of dealing with ideas and managing ideas coming in to a system and then progressing through a system” (Commercial Innovation Director).</i>	Organization B
	<i>“No, the idea for this came from HR, and I came to Denmark and within the first month, the HR director came to me and he said, you know, I’ve got this idea; I want to discuss it with you. We should have... I met this guy; he’s got this idea management system, blah, blah, blah; this is the reason to do it. And, quite honestly, I’d come new here, I needed to also make an impression that I promote ideas, I make, you know, implement ideas; I don’t want to say no” (Commercial Innovation Director)</i>	Organization B
	<i>“So I think that’s very important also internally to sell it, in that you have some clear strategic direction. So why do you want to have a platform like this? What do you want to get out of it?” (Commercial Innovation Director)</i>	Organization B
<b>Phase 2. Designing and Developing the System Configuration</b>		
<b>Evaluating External Providers</b>	<i>“We went through a very extensive vendor evaluation process...What we’re looking for in a partner is somebody that can actually have all those conversations with, not just a technical conversation about what it means to open up, but a psychological conversation about how users [employees] feel and how they perceive things.” (Senior Manager Open Innovation)</i>	Organization E
	<i>“Then we looked at what other solutions were available at the market; so we did an evaluation of several other idea management portals. We went through the documentation, we participated in webinars; we had some meetings with some of the idea management suppliers. And then, we evaluated an open source solution and we compared that with the evaluations we had from the other systems, and then we decided that we could quite easily develop out of this open source solution.” (Senior IT Management Advisor)</i>	Organization A
	<i>“This is probably the biggest and a very xxx company, and these guys are from the UK. I’ve seen both these guys and I really like these guys because they are more forward-thinking” (IT program manager)</i>	Organization D
	<i>“So, technically speaking, what we should have done is: do we need an idea management system? Yes, okay. Which is the right service provider to build that for us?” (Business Development Consultant)</i>	Organization B

<b>Setting up Incentive Mechanisms</b>	<i>"Not necessarily material although everybody likes a little reward in the form of money or red wine, but also the recognition from the boss. They see our ideas; we can't use it now but thank you, it's a good idea." (Senior IT Management Advisor)</i>	Organization A
	<i>"What we did here was try to create some initiatives through rewards, there was a reward system and the reward system was based on different factors – such as how much input did you have? How many have looked at it? How many ideas have you created? This, obviously, is not enough to drive activity on a wider-scale platform, but that was the reward system." (Business Development Consultant)</i>	Organization B
	<i>"What we really want to create is a great participation experience and that could be reduced just to that one sentence. That means different things for different people so, that might mean a different thing to an employee, and to a child fan and to a father of that child fan so, one of the things that we want to do is make sure we have something for everybody." (Senior Manager Open Innovation)</i>	Organization E
	<i>"There is an option to actually do a stock market of ideas, so you can use your personal points to invest in other peoples' ideas and when they increase in value you get benefit from that. So the points then are accumulated and there's a store in the tool where you can go in and spend your points on anything from a chocolate bar to a trip for five to Hawaii. It just depends on how many points you invest." (Coordinator)</i>	Organization D
	<i>"Feedback is very important, and I think it's... that's definitely one of the strengths of having a system like that, because you will feel that... you will get a feeling that the feedback is less biased. If you get a feedback from your manager, you know that when you've been in the company for a number of years, then you get certain relations." (Senior IT Management Advisor)</i>	Organization A
	<i>"So if I need to put up incentives to make them generate ideas, then I have the wrong employees. You could say, yes, I know, an incentive is something which does something but, no...my expectations would simply be that if we involve them they also participate and they also generate something, and they hopefully can see that they can create even more value towards the business as well." (Idea Manager)</i>	Organization C
<b>Designing the Participation Architecture</b>	<i>"It could also be that, for instance, me being from an IT and a sort of natural science background, I look at problems in... with those eyes but my colleagues that have a background within social science, they look at the same problem in completely different ways. So that was the reason why the comment, we thought the comment part was important." (Senior IT Management Advisor)</i>	Organization A
	<i>"And at that time, we had an organization that was very focused on sales, new customers, new processes, new products. So we started to take one of the top three or top five issues to make it possible to have a direct link between the platform and our top five issues" (Chief Reviser)</i>	Organization A
	<i>"We look to other examples of companies that are doing things like that and they are usually entrepreneurs, you know, they're entrepreneurs that are coming up with new business models that are heavily dependent on collaboration and communities and collective intelligence and so, we obviously have to look at the crowd funding model." (Senior Manager Open Innovation)</i>	Organization E
	<i>"We had to make it so simple that the first step didn't involve that you should spend ten minutes with the check boxes etc. and write a lot. Just come up with an idea as simple as possible." (Chief Reviser)</i>	Organization A
<b>Defining the Evaluation Mechanisms</b>	<i>"So idea generating process was, there's a lot of ideas coming in and we would have one person to make a screen. Just one person should take every idea that came in and make a first screening. And the screening could be these three ideas are just put in our organization, the normal way to handle ideas, because this is our internal administration. We just hand it over. And these ideas are handed over to our development organization, because it's an idea that's a part of our development process with our standard products. It could be an idea to improve an existing process, so they get handed over to that part of our organization that takes care of it. And these three projects, that person would make the screening would say, okay, I'd suggest that we do some proposal for a team. And we set up a team from the top management, who should look only at these, because this was just ordinary business" (Chief Reviser).</i>	Organization A

	<i>"But it just stayed with the discussion, back and forth, back and forth, because there was no ownership. There was nobody who was actually responsible for taking this on and deciding is this something to go for or is it not? So it just stayed on elaborating, that's good – people talking about innovation – but innovation is useless if you do not implement it". (Business Development Consultant)</i>	Organization B
	<i>"This platform was just not good enough at all, and there were no evaluation criteria whatsoever, so nothing really happened – there was no execution." (Business Development Consultant)</i>	Organization B
	<i>"Here's the community monitoring, the community managers that have to do with the participation that's happening in the platform. But there's also a huge, sort of, back office element. So when these ideas come in not only do the people who proposed the idea to the commons who want some sort of feedback, we have to make sure that information goes to the right person, the right expert inside the company." (Senior Manager Open Innovation)</i>	Organization E
	<i>"Actually, we don't have a process for that today, to be honest. It's some of the things we need to start working on, especially when we talk about our frontloading organization and stuff like that, but we don't have a mature set up for how to handle the ideas." (Idea Manager)</i>	Organization C
	<i>"It is not within the scope of xxx to evaluate the ideas but it was in the scope to facilitate the ideas and send them on to a person who can evaluate the ideas. But my impression was at that time, if you can imagine that you had your job 100 per cent, very busy, and then here's an idea – please evaluate this idea. More work – nice idea, I will get back to that later". (Project manager)</i>	Organization C
	<i>"So basically what I have is some coordinators sitting in the organization; there are 17 coordinators sitting all over the organisation so when I see something, this is engineering, cool – so I send it to a coordinator for engineering. She then picks it up and she has a matrix of who does what...And so she has a matrix that tells her who is the expert on what and that takes a lot of updating because with 1000 engineers that go in and out and change jobs and all that sort of stuff, it constantly needs updating. And then from that matrix she sends it to someone, when that person receives it they have two weeks to evaluate – is this an idea? If it's not an idea they reject it with a good answer". (Program manager)</i>	Organization D
<b>Phase 3: Implementing the System</b>		
<b>Creating the Implementation Strategy</b>	<i>"If we want to have a systematic communication, obviously we want to approach corporate communications; and they own the intranet and, of course, we negotiated for them to give us a little space for us to put a banner, so where people that visit the corporate intranet every day could have an immediate front door to access our platform; but really that sort of interaction and that sort of teaming up has to happen in many different angles...so, corporate communications is one of them but you can imagine how that would influence consumer services, how that would influence creative processes within the organization." (Senior Manager Open Innovation)</i>	Organization E
	<i>"That is really the big problem that we have is we had a complete implementation plan, but we are...in a phase right now where we have a lot of things on the strategic agenda; the management and the board, they have some very specific changes they want to have the organization implement. So there was not really any space for us to do a proper implementation. What we wanted to do, we planned actually, we had a campaign plan and we had an introduction plan where we wanted to visit all the offices and do some work shopping together with them to introduce them to the system. But we couldn't get the time to do that, so it was implemented in a very, very basic way; we had a webinar inside the company where we spent about, I would say, 20 minutes or so, presenting the portal. And that was a webinar where we had other things also; so we had 180 people at this webinar, and first they were presented with a lot of other issues, and then finally they got the presentation for the idea portal. (Senior IT Management Advisor)</i>	Organization A
	<i>"No, we put a version one up; like I said, we did it very quickly, and then we learnt what was not working about it and what we needed to work better. And we had conceptualized a version two, but we then didn't implement the system".(Commercial Innovation Director)</i>	Organization B

	<i>"If some people think that it wasn't professional enough from the beginning, I actually fully understand why, because it was just let's go and do it. We'll launch on this date and we'll launch whatever we have, we'll try to make it the best before this date...I think this is also why it wasn't thought through that well" (Business Development Consultant)</i>	Organization B
	<i>"I think I had no idea – I went into this pretty naïve – give me three months and I will put up an idea management system in 20 per cent of my time. Now I see this as mission impossible". (Idea manager)</i>	Organization C
<b>Scope of the Implementation</b>	<i>"Yes, it was technically global; it didn't really go global. I mean, it was open global, but in the first stage it was more about making it work in Denmark and the parts of Denmark that have access to computers. So, for example, our sites and staff, we put up a poster, but not more than that"(Commercial Innovation Director)</i>	Organization B
<b>Top-management Support and Resources</b>	<i>"There's been real management back-up, huge management back-up, to get this going – which is then why you can actually move. There is nothing, we can't live without management back-up." (Coordinator)</i>	Organization D
	<i>"I think what we really struggled with are resources – resources are the absolutely most important. You need man-hours because this takes a lot of time to maintain and develop and being active, because if you don't do anything as the owner of a platform like this, nothing will happen. The users will not do it themselves, I think that's a pretty naïve thought. And then money – it costs a lot of money to establish platforms like this." (Business Development Consultant)</i>	Organization B
<b>Phase 4: Fine-tuning the System</b>		
<b>Mismatch of Expectations</b>	<i>"When we researched and interviewed people about how they felt about the old system, they felt cheated, that they would send something into a black hole and nothing ever happened, and so on... And then when starting to look at the system, what we thought was wrong, there were two major issues – what I talked about, that we don't want to collect ideas anymore, but more support the employees – this was the main thing. Another thing was that when we looked at the more technical aspect of the platform, it was kind of outdated. It had been a very good platform, there was one time when an idea management system was an idea box, and then at this time the idea box became digital and then that was great, but today we expect so much more. We expect this platform to be collaborative, so this was also a main reason for changing it, to make it follow the time and technology" (Idea Manager)</i>	Organization C
<b>Improving the Participation Architecture</b>	<i>"It's not just about getting beginning ideas, but it's about problem solving. So, you know, I would like to do frozen yoghurt but I have this issue in my supply chain. So I need ideas to solve supply chain problems. So it's part of a bigger concept, if you like." (Innovation Director)</i>	Organization B
<b>Improving the Evaluation Mechanisms</b>	<i>"I need more evaluation steps. I need more evaluation really because I get lots of ideas, the trouble is to get people to evaluate them and take it seriously. Okay, so how do I do that? Then I'm going into a tool called xxx because it's crowdsourcing. So I'm going the crowdsourcing way. So what I've done, I've researched a lot about the intelligence of crowds – can I rely on the crowd to evaluate an idea about something they know very little about?" (Program manager)</i>	Organization D
<b>Gaining Top-management Support</b>	<i>"But we start rebuilding the tools and now we are dealing with getting the top management to understand how important it is to make people come with good ideas, to make our screening worth doing. To get decisions made down here and this is what we have to live from tomorrow, next year, next decade. But easy? No. We knew that". (Chief Reviser)</i>	Organization A
<b>Linking IMS to the firm strategy</b>	<i>"How well and, does this connect with people, with internal processes, with the expectations? " (Senior Manager Open Innovation)</i>	Organization E
	<i>"We actually show users how they can actually use those simple tools to address specific needs within different departments." (Senior Manager Open Innovation)</i>	Organization E

<p><i>"If we can create a common framework, a common system that is very generic and it could be used in many different ways, it will trigger a lot of people to participate in it and develop within that system. And that is really the key." (Senior Manager Open Innovation)</i></p>	<p>Organization E</p>
<p><i>"So we approached corporate communications and tried up... Basically it's a strategy to try to partner up with existing departments and channels so, you don't want to become this really big organization that everything works through you, you, kind of, want to enable the existing parts of the organization to adopt open innovation practices". (Senior Manager Open Innovation)</i></p>	<p>Organization E</p>
<p><i>"We'll do advertising of the tool and we'll partner on the tool, another way is to go to a department and say, we can solve some of your problems with this technology and that's, sort of, a more natural way for them to adopt the tool, it makes more sense, it's easier for them to rationalize spending time in this new platform." (Senior Manager Open Innovation)</i></p>	<p>Organization E</p>
<p><i>"So basically what we're going to do is a viral approach, so I have selected 80 people who I believe are innovation practitioners, they're going to get the first licenses. They will then get two invitations each and they will be asked to send these to people whom you believe are innovation practitioners, okay? So then we spread like a virus, so that's the way we're going to do it". (Program Manager)</i></p>	<p>Organization D</p>

### 1.4. Example of a Cross-Case Analysis Table Developed During Data Analysis

Dimensions	Organization A	Organization B		Organization C
		Version 1	Version 2 (not implemented)	System 1
<b>Drivers</b>	External competitive pressures	External isomorphic pressures. Internal pressures to develop a system to involve employees and handle their ideas.	Foster collaboration	External isomorphic pressures. Internal pressures to develop a system to involve employees and handle their ideas. (Year of Innovation).
<b>Evaluation of external providers</b>	Decision to develop the system internally	Rushed evaluation. They hired the provider that initially contacted them.	Development of a new version with the same provider.	Rushed evaluation. Focus on the technological capabilities.
<b>Incentive mechanisms</b>	Some monetary rewards. Recognition and feedback.	Focus on monetary rewards	Emphasis on recognition and rewards.	Lack of an incentive structure. Employees should be intrinsically motivated.
<b>Participation architecture</b>	Focus on user-friendliness. Focus on making the system interactive. Bottom-up approach.	Bottom-up approach	Focus on interaction and collaboration Develop a more user-friendly system. Introduction of challenges.	Bottom-up approach.
<b>Evaluation mechanisms</b>	Administrator executes the first screening and transfer ideas to relevant department.	Not established. The system should be self-sustaining.	Introduction of a voting system. Panel of experts. Provide feedback	2-step process: Facilitators and management board (not implemented)
<b>Implementation strategy</b>	Development of a complete implementation plan. However, only a limited and rushed implementation due to other priorities in top management agenda.	Rushed implementation, limited to a communication template.	Improve communication. Create videos to train employees.	Limited communication to promote the system. Rushed implementation.
<b>Scope of the implementation</b>	Local	Local	The intention was to implement it more globally.	Local
<b>Link IMS to firm strategy</b>	Limited focus on linking the system to current processes.	Lack of focus on linking the system to existing processes.	-	Lack of focus on linking the system to existing processes.
<b>Top management support</b>	Lack of support and involvement from top management. Limited resources available.	Lack of support and involvement from top management. Underestimation of the resources needed to develop the system.	Focus on gaining top management support	Decreasing support of top management

Dimensions	Organization C	Organization D		Organization E
	System 2 (in the initial phases)	Version 1	Version 2	
<b>Drivers</b>	Foster collaboration	Create a cultural change	Foster a culture of collaboration	Realize an open innovation strategy Foster an innovation culture internally
<b>Evaluation of external providers</b>	Decision to develop it in-house	Decision to develop it internally	Decision to use an external provider to create an improved version	Decision to use an external provider. Careful evaluation process.
<b>Incentive mechanisms</b>	No incentives provided to employees. Reliance on their intrinsic motivation.	Prizes, gifts and monetary incentives Recognition	Recognition and rewards. Make the participation fun and entertaining (gamification). Introduction of a points-based system.	Recognition. Make the participation fun and entertaining (gamification). Points-based system.
<b>Participation architecture</b>	User-friendliness Focus on collaboration and interaction Organized around challenges and discussion groups.	Accessibility on the intranet User-friendliness Bottom-up approach	Focus on interaction and collaboration Improve user-friendliness. Introduction of challenges	Focus on interaction and collaboration (discussion groups and communities). User-friendliness and visibility. Unsolicited ideas and challenges.
<b>Evaluation mechanisms</b>	No evaluation mechanisms defined. The system should be self-sustaining.	Coordinators are responsible for screening ideas and send them to experts. Standardized feedback sent by email. Face-to-face meetings to refine ideas	3-step process: crowd (voting system); coordinators; experts. Definition of clear criteria. Provide constructive and customized feedback.	Panel of experts. Provide constructive feedback Definition of clear criteria.
<b>Implementation strategy</b>	Improve communication by employing both offline and online channels. Workshops to train employees.	Intensive communication through online and offline channels. Training initiatives through coordinators.	Intensify communication. Online and offline initiatives to train employees.	Intensive promotion through offline and online channels. Community managers. Training initiatives.
<b>Scope of the implementation</b>	Local	Global	Global	Global
<b>Link to firm strategy</b>	-	Focus on linking the system with existing processes for innovation	Focus on linking the system with existing processes for innovation (viral approach, collaborations)	Focus on linking the system with existing processes for innovation (partnerships and collaborations)
<b>Top management support</b>	Lack of clear strategic direction from top management	Strong support from top management	Strong support from top management	Strong support and involvement from top management



## Essay 2

# Moderating Ideation in Web-Enabled Ideation Systems<sup>4</sup>

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### Abstract

This paper develops a model to explain how the ideation process is managed and moderated in web-enabled ideation systems. The increasing implementation of new online tools and systems to generate innovation from internal sources has opened up new possibilities to actively facilitate ideation within organizations. In this study we focus on exploring an emerging set of actors – broadly labeled as ‘moderators’ – who assume the informal role of facilitating employees’ ideation efforts. While many recent innovation studies focus on the benefits and functionalities of these systems, less attention has been placed on understanding how ideation efforts are moderated and managed. In this respect, we draw on a qualitative, inductive case study of a large organization headquartered in Sweden to explore the role of moderators in supporting the early phases of the innovation process. Our model highlights that moderating ideation entails various types of interventions, where moderators are not only involved in organizing the search for new ideas, but also in developing and championing them to attract resources and management support for their implementation. Moreover, we identify three key antecedents that may influence the way ideation is moderated and thus subsequent ideation performance: moderators’ flexible role orientation, initial motivations and time available for innovation. Finally, our findings suggest that moderating ideation entails three key paradoxical issues: (1) search behavior focus; (2) extent of direction in driving search behavior; and (3) goal-setting to influence employees’ efforts. We unfold each paradox by discussing its underlying tension and related moderators’ strategies to manage it. Implications for both innovation management theory and practice are discussed.

**Keywords:** *idea management; innovation; moderators; front-end of innovation*

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<sup>4</sup> This essay is a revised version of a paper presented at the IPDM conference 2014. We are grateful for the feedback we received during this conference. Also, this essay has received a first invitation to ‘Revise and Resubmit’ at the *Journal of Product Innovation Management*.

## **1. Introduction**

The innovation literature emphasizes the importance of ideation for innovation. Ideation constitutes the basis of any innovation (Bjork et al. 2010) and thus can provide important inputs to sustain it (Boeddrich 2004). In the last decades organizations have increasingly adopted dedicated web-enabled systems to support the collection, generation, development and evaluation of new ideas and solutions (Van Dijk and Van den Ende 2002; van den Ende et al. 2014). These systems at the front-end of innovation enable organizations to work with ideas in a more proactive manner as well as to utilize the wider collective intelligence of diverse and distributed individuals (Jeppesen and Lakhani 2010). As such, they change the way ideation takes place leading to more open and collaborative approaches (Gorski and Heinekamp 2004; Sandstrom and Bjork 2010).

The increasingly collaborative and open character of ideation opens up new needs and possibilities for roles that support and drive ideation efforts within organizations (Howell and Boies 2004; Whelan et al. 2011). Within this context has emerged a set of actors who may be broadly termed as ‘moderators’ and who perform a variety of activities to guide the generation and development of ideas in web-enabled ideation systems. As such, these moderators act as orchestrators of ideation by assuming the informal role of facilitating employees’ ideation efforts. However, as this represents a new phenomenon, there is limited knowledge about what these moderating roles look like as well as how they work. Whereas current innovation studies have investigated the functionalities and performances of ideation systems, little attention has been placed on understanding how the ideation process is moderated and managed. This lack of knowledge is particularly problematic considering that managing the early phases of the innovation process, often labeled as the front-end of innovation, constitutes a crucial issue for organizations (Khurana and Rosenthal 1998). Due to its uncertain and ambiguous character, “managing this phase of innovation is delicate and

can be detrimental to firms' innovation processes unless strategically managed" (van den Ende et al. 2014, p. 1). Hence, our study addresses this research gap by investigating how the ideation process is moderated and managed in the context of web-enabled ideation systems. By doing so, our aim is to shed more light on the role played by moderators in the early phases of the innovation process. We argue that addressing this research gap is crucial for two reasons. First, it is claimed that moderators may favor the creation of "an active community of innovators" (Adamczyk et al. 2012, p. 350) which can then contribute to innovation on a continuous basis. As such, they may play a crucial role in driving employees' creative and innovative efforts. However, an understanding of what moderation means as well as how it is conducted by these emerging actors is lacking in this context. Second, as the use of ideation systems enables individuals to span various internal boundaries within an organization - thus favoring access to diverse and distributed individuals and communities - these emerging roles potentially assume a broader and significant role in managing the ideation process in virtual and distributed settings (Whelan et al. 2011). At the same time, recent studies emphasize important differences in the success and performances of these systems, especially due to issues such as failure to motivate employees and improper management of ideation activities (Birkinshaw et al. 2011). Relatedly, it can be argued that the way the ideation process is moderated and managed by these emerging actors may have an impact on the ideation performance of these systems. Hence, we argue that moderating ideation constitutes a significant aspect requiring further investigation.

Given the limits of extant theory, our research is exploratory (Eisenhardt 1989) and entails an inductive, qualitative case study of a large organization headquartered in Sweden. This organization has a well-established web-enabled system for managing employees' ideas, based on dedicated virtual idea boxes and on the introduction of the moderator's role (Bjork et al. 2014). This organization constitutes a relevant context for the analysis, as its system is

driven and managed by a collective of distributed moderators – i.e. employees who assume the informal role of facilitating employees’ ideation efforts. As such, the distributed character of the ideation system as well as the decentralized decision-making authority allocated to moderators makes this organization an unparalleled case (Yin 2009).

The contribution of this study is twofold. First, our study complements and augments existing innovation management literature by shedding more light on the way the ideation process is moderated and managed in web-enabled ideation systems. Our findings suggest that moderating ideation entails various interventions directed at influencing both employees and higher level management in order to manage the front-end of innovation in a distributed manner. We argue that our findings may provide important insights on how to manage this delicate and uncertain phase of the innovation process when using online ideation systems. Moreover, our emerging conceptual model identifies key antecedents and consequences of moderating ideation that need to be taken into account. Second, we contribute to the discussion about managing tensions in the front-end of innovation by highlighting how moderating ideation entails three key paradoxical issues that need to be properly addressed: (1) search behavior focus; (2) extent of direction in driving search behavior; and (3) goal-setting to influence employees’ efforts. We unfold each paradox by discussing its underlying tension and corresponding moderators’ strategies to manage it. Relatedly, we identify a new tension between the use of performance targets and incentive mechanisms which has not been previously addressed in the innovation literature. Finally, our study has implications for practitioners aiming to improve the contribution of moderators to the early phases of the innovation process. The results from this study may constitute valuable inputs to generate guidelines for supporting moderators in managing ideation as well as for developing proper incentive structures to drive employees’ behavior. Such developments would be beneficial to

further improve the functionalities of web-enabled ideation systems and, in the extension, increase ideation performance.

## **2. Exposition of Theory**

Generating, developing and selecting good ideas to be transferred into the innovation funnel is crucial for organizations' innovative performance (Cooper 2008; Kijkuit and Van den Ende 2010). The increasing adoption of more open and collaborative ideation systems enables organizations to provide support and structure to the front-end of innovation (Sandstrom and Bjork 2010). In this respect, recent innovation studies have investigated specific characteristics of the idea submitter (Deichmann and van den Ende 2014), the importance of social networks for ideation (Bjork and Magnusson 2009; Bjork et al. 2011), or how different leadership styles may affect employees' engagement in innovation and subsequent outcomes (Frese et al. 1999; Deichmann and Stam 2015). However, current studies do not address how the ideation process is moderated and managed in web-enabled ideation systems as well as the types of activities moderators perform to drive employees' ideation efforts. This is also salient considering the current debate in the innovation management literature about the importance of unfolding the innovation process in organizations and its complexities (Garud et al. 2013). At the same time, the innovation literature points to the existence of key tensions in relation to the front-end of innovation which have not been properly addressed (Bjork et al. 2010; van den Ende et al. 2014). In what follows, we discuss the key phases and activities of the front-end of innovation with the purpose of highlighting existing gaps in the innovation literature both in relation to how these phases are moderated and their corresponding emerging tensions.

### **2.1. Idea Generation**

Current research emphasizes that idea search and idea generation constitute crucial activities to foster the innovation process, as they enable to enhance organizations' internal variety (March 1991). The use of web-enabled ideation systems provides organizations with opportunities to expand their search for ideas and solutions within their organizational boundaries, by tapping into the broader collective intelligence of their distributed employees (Neyer et al. 2009; van den Ende et al. 2014). However, little is known about how idea search and idea generation activities are managed by moderators when using these systems. Relatedly, a current debate within the innovation management literature relates to whether the search for new ideas and solutions should occur through top-down or bottom-up driven approaches. On the one hand, the top-down approach provides direction to the search process by guiding employees' ideation efforts toward specific organizational areas or issues (Birkinshaw et al. 2011). In this way, "it removes the risk of random or ill-focused innovation" (Birkinshaw et al. 2011, p. 49) by creating a specific demand for ideas. Crowdsourcing platforms (Poetz and Schreier 2012) or idea competitions (Lampel et al. 2012) are examples of innovation tools using this principle. On the other hand, an unstructured bottom-up approach is argued to be important, as employees at all levels have the potential to generate valuable ideas for their organizations (Grant 1996; Boeddrich 2004). It thus enables to identify ideas "in areas where the organization is aware neither of problems nor solutions" (van den Ende et al. 2014, p. 3), by providing freedom to employees in their ideation efforts (Nonaka 1994). However, little is known about how moderators balance this tension between direction and freedom in web-enabled ideation systems.

Moreover, another important aspect of the idea generation process relates to how to motivate employees to actively participate to ideation. In general, both intrinsic and extrinsic motivational factors are argued to affect individuals' engagement in innovation activities (Amabile 1997). While intrinsic motivation is considered crucial in driving individuals'

participation (Amabile et al. 1996), less clear is the effect of extrinsic rewards such as monetary incentives. While some scholars argue that extrinsic rewards alone may lower individuals' creative performance (Deci et al. 1999), others emphasize that they may have a positive effect when they provide valuable information and recognize individuals for their contributions (Eisenberger and Armeli 1997). Previous innovation studies highlight that providing incentives, both monetary and non-monetary, is crucial for engaging individuals in collaborative innovation (Piller and Walcher 2006; Pisano and Verganti 2008). With the diffusion of ideation systems, organizations face the challenge of engaging and managing the heterogeneity of distributed employees across the whole organization. This becomes particularly salient considering that the performance of these systems depends on employees' voluntarily contributions (Reuter 1977). However, there is limited knowledge about how moderators stimulate and facilitate employees' engagement in ideation systems.

## **2.2. Idea Development and Evaluation**

While a substantial part of the innovation literature is concerned with the generation of ideas, little attention is placed on investigating subsequent and equally important phases of the front-end of innovation, such as the development and evaluation of ideas (Girotra et al. 2010). In particular, the idea development phase is considered crucial to move ideas further "from a one-liner into a detailed proposal" (Kijkuit and Van den Ende 2007, p. 866). Various scholars indicate that idea development is very often a collaborative process (Burt 2004; Perry-Smith 2006). In fact, interactions with diverse people enable to identify new alternatives and access diverse competences and expertise, thereby contributing to further improve an idea (Kijkuit and Van den Ende 2010). Moreover, it is argued that various formal management practices may influence how employees develop their ideas (Globocnik and Salomo 2014). However, this discussion does not address the question of how moderators manage this important phase of the front-end of innovation process.

Finally, during the evaluation phase ideas are either rejected or, in case of selection, further resources are allocated to move them further for implementation (Kijkuit and Van den Ende 2010). Different scholars posit that this phase constitutes a crucial challenge for several organizations (Bjork et al. 2010). This challenge is especially emphasized by the diffusion of online tools which enable the collection of a large amount of ideas, thus creating difficulties for organizations in terms of handling such inputs in a proper way (Poetz and Schreier 2012). As organizations possess limited attentional capabilities when it comes to the screening of a large amount of ideas (Koput 1997), receiving mechanisms are needed to support their evaluation (Soukhoroukova et al. 2012; Kock et al. 2014). This is to make sure that the most valuable ideas are detected (Kester et al. 2011). In relation to ideation systems, there is limited knowledge about how the selection process is managed. More precisely, we have a scarce understanding of the role played by moderators in establishing receiving mechanisms for the evaluation of submitted ideas. At the same time, a key issue is how to manage the selection process without affecting employees' future ideation efforts (Bayus 2013).

Overall, this brief review of literature highlights that, when it comes to web-enabled ideation systems, an understanding about how the various phases of the front-end of innovation are managed and moderated is still limited. In addition, some aspects related to ideation appear to be paradoxical and thus require a better understanding, particularly in relation to how to manage underlying tensions in a proper way. This leads us to the formulation of the following research question for this study: *“How is the ideation process moderated and managed in web-enabled ideation systems?”*.

### **3. Methods Used**

Due to the limits of extant theory, our research is exploratory and entails an inductive qualitative case study (Eisenhardt 1989). We employed a single case study for two reasons.

First, while being aware of the difficulties of building theory from a single case study, we selected ‘Gamma’ (a pseudonym is used to ensure confidentiality) due to the uniqueness and novelty of the phenomenon (Siggelkow 2007). Over the years Gamma has developed a self-organizing, collaborative ideation system, based on dedicated virtual idea boxes and on the introduction of a moderator role (Bjork et al. 2014). The system is driven and managed by the collective of distributed moderators – i.e. employees who assume the informal role of facilitating ideation. The distributed character of the ideation system as well as the decentralized decision-making authority allocated to moderators makes this organization an unparalleled case (Yin 2009). Second, the use of this case responded to our need to expand theoretical categories related to the moderation of ideation which current research has not fully addressed (Lawrence et al. 2002). Hence, the Gamma case was well suited for our research purpose because of its potential to generate a rich understanding about the moderation of ideation. Moreover, it is important to emphasize that our single case study entails different units of analysis as our aim is to explore the various activities, practices and mechanisms established by moderators to manage the ideation process as well as emerging tensions. As such, we selected a sample of idea boxes (20) across the organization and interviewed their ‘drivers’, the moderators, to further understand their supporting role. This enabled us to identify, compare and capture the variation in the practices and mechanisms employed by moderators across the selected idea boxes and thus to understand the content and significance of their role. Hence, we adopted an embedded case study research design (Yin 2009).

### **3.1. Research Setting**

Gamma is a leading organization headquartered in Sweden which provides communication technology and services. In 2008 Gamma developed a collaborative web-enabled system for collecting and managing employees’ ideas. This system was designed around virtual idea

boxes and the key principles of openness, collaboration and sharing, with the purpose of enabling all employees widely distributed across the organization to share and develop their ideas. Over the years the system has attracted increasing participation and interest - through viral marketing - and has been broadly adopted across the organization (Bjork et al. 2014). In mid-2011 it became the main idea management tool across the whole organization, replacing several existing idea management practices. The main ambition of Gamma was to develop a self-organizing system to ensure that ideas coming from distributed employees would be transferred to different parts in the organization (Bjork et al. 2014). Thus, the main objective was to handle ideation efforts in a distributed way, also in light of the diverse innovation needs spread across the whole organization. As such, the role of the moderator was introduced in the attempt to fulfill this ambition. Nowadays, the system counts approximately 440 different virtual boxes, more than 35,000 submitted ideas and around 70,000 comments coming from employees throughout the whole organization (Bjork et al. 2014). Moderators create virtual idea boxes themselves and, as such, become responsible for facilitating employees' ideation efforts. It is important to highlight that the 'moderator' represents an informal role within the organization and can be covered by any employee fulfilling certain requirements. For instance, a key requirement is that employees should have some available resources to manage their idea boxes as well as a well-defined process. Because of its informal character, employees who decide to become moderators are expected to manage ideation efforts in their idea boxes in conjunction with their daily work-related activities and without receiving any additional compensation for it. Therefore, we selected this setting because it provides a theoretically relevant context (Eisenhardt 1989) for exploring how the ideation process is moderated and managed in an online ideation platform.

### **3.2. Sampling**

In order to collect our data, we first performed a selection of relevant idea boxes and related moderators to be included in our study. This selection process was motivated by the complex and dynamic setting characterizing the ideation system and thus by the necessity to grasp this inherent complexity in our study. In particular, the virtual idea boxes significantly differ among each other in terms of their scope. For instance, they differ in their geographical scope, being global, regional or more locally oriented. Also, some idea boxes are more organizational-oriented and thus organized around one or more specific organizational areas, products or technologies. Other boxes, instead, address a more specific innovation need or organizational issue and thus are characterized by a problem-driven approach. Due to the complexity of the ideation system, we decided to involve a manager from the organization in the idea boxes' selection process. This manager constituted one of our key informants, as he is a co-founder of the ideation system and thus possesses relevant knowledge and understanding about how the system works and about the different types of idea boxes. During this process, our main purpose was to select different types of idea boxes in order to fully grasp their diversity in terms of categorization. In addition, we aimed at selecting idea boxes with different levels of performance. This was mainly to further explore whether we could observe any relation between the way ideation was moderated and the boxes' subsequent ideation performance. Hence, this selection process ensured that we included in our study a diverse set of moderators managing different types of virtual boxes, not only in terms of their scope, but also in terms of their activity levels. Table 1 provides an overview of the selected idea boxes (20).

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

### **3.3. Data Collection**

Our case study involved the use of multiple data sources, including interviews, documents, site visits and observations. We used these sources to triangulate our findings and thus as a

way to increase construct validity (Yin 2009). We collected our data between September 2013 and February 2014. First, we conducted semi-structured interviews with 26 moderators involved in the management of the selected idea boxes. As the ideas boxes are often managed by more than one moderator, in some cases we interviewed additional informants for the same idea box, in order to gather supplementary perspectives and insights. We recruited respondents by using a 'snowballing technique' (Lincoln and Guba 1985), in which our initial informants provided access to additional key moderators to be included in our study. Moreover, we interviewed the two main founders and developers of the ideation system. This was mainly to generate additional insights into the moderation process as well as gain a deeper understanding about how the ideation system worked. We used some of the categories from the innovation literature reviewed earlier to develop our interview guide. Typically, we began by asking interviewees general questions to understand how they perceived their role as moderators as well as how they executed it. Thereafter, more specific questions aimed at uncovering their motivations to become moderators and the types of activities performed to manage the ideation process. Interviews lasted from half an hour to one hour, were recorded and subsequently transcribed to ensure reliability (Eisenhardt 1989). To reach saturation, we collected data until no more relevant content emerged from the interviews (Glaser and Strauss 1967) (See Appendix 1.1 for the list of recorded interviews). Second, we collected a range of documents from our interviewees to better understand their role as moderators. These documents included presentations, reports and marketing material employed to promote the idea boxes across the organization. Also, they provided important background information about the content of their idea boxes as well as indications about their performance. Finally, a one-week field trip by one of the authors to a local office in Hungary offered the opportunity to further improve our understanding of the moderation process at the operational level. The main purpose of this field trip was to interview key moderators

managing some of the selected idea boxes. Moreover, this local office constituted an interesting setting for our study because of its focus on developing numerous specific organizational-oriented idea boxes, resulting in different search scope and activity levels. During the field trip, one of the authors had the possibility to interview several moderators, conduct observations of the main practices in the local site as well as have various informal discussions. This field trip provided valuable insights on the role played by moderators as well as highlighted differences in the mechanisms established by them and in the levels of commitment to their role. During the site visit the author took notes of the observations and we used them to augment our findings from the semi-structured interviews.

### **3.4. Data Analysis**

Our data analysis process proceeded in an iterative way, where we constantly compared our data, emerging categories and relevant literature with the aim of developing an integrative framework. While prior innovation literature informed the initial analysis, we considered other theoretical interpretations during the process. We coded our data using the software NVIVO. We drew on the different sources to explore how the ideation process was managed by moderators. First, we read through the interview transcripts to identify ‘first-order’ concepts. Some of these concepts were developed from the literature while others emerged as new during the analysis. We constantly compared the different sources of data to make sure we reached saturation. During the coding process we focused on identifying and categorizing: (1) the types of activities performed by moderators to manage the ideation process; (2) the practices and mechanisms established to conduct such activities; (3) the observed effects of these practices on the system ideation performance, and (4) emerging tensions and their management. We then aggregated these categories into second-order dimensions (Van Maanen 1979). Finally, in the last stage we compared the identified dimensions to detect patterns and relationships (Glaser and Strauss 1967). When comparing moderators’ practices

across idea boxes, we used techniques for data reduction and presentation (Miles and Huberman 1994). For instance, we organized data into tables to facilitate comparisons across cases (examples are reported in appendixes 1.2 and 1.3). Moreover, to further validate the data and the interpretations, we presented preliminary findings to key informants. For instance, we organized a workshop session in Stockholm to discuss with our key informants the preliminary findings and thus collect their views and insights as well as to generate further interpretations. This allowed us to further increase the construct validity of the study (Yin 2009). Figure 1 summarizes our main data structure.

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

#### **4. Results and Analysis**

In this section we describe the results of our empirical investigation and our main research findings. We found that the ideation process is managed by moderators through the conduction of four crucial activities: (1) organize the search for new ideas; (2) stimulate the generation of new ideas and solutions; (3) establish a process for screening and evaluating ideas; and (4) involve themselves in developing and championing valuable ideas to take further for implementation. Hence, the moderator's role entails a comprehensive follow-up and support of the ideation process. We identified significant differences between moderators in the types of mechanisms and practices established to perform the four outlined activities. Moreover, while unfolding these mechanisms, we identified key emerging tensions surrounding the moderation of ideation. In what follows, we uncover the various mechanisms underpinning each set of activities and related tensions.

##### **Organizing the Search for New Ideas**

*“Box managers would not exist if people do not understand what ideally they have to put into that box. So the first role of the box manager is to make sure that he defines the scope of the box correctly, and when people, team members come*

*with an idea, you know that you have motivated enough to see that kind of ideas to be submitted to that box.”(Box manager, idea box 12)*

As highlighted by the quote, moderating ideation entails organizing the search for ideas through the definition of its scope. Thus, it aimed at both guiding employees’ ideation efforts and fostering idea generation (Mumford et al. 2002). We observed that moderators differed greatly in the way they defined the scope of this search. More specifically, we identified an important tension between organizing the search for ideas around desired organizational areas and conducting a more unfocused and undirected search.

On the one hand, we found that most moderators provided direction to the search by framing the scope of their idea box around: (1) an innovation need or (2) specific fields of search. As such, employees’ search behaviors were directed toward specific innovation needs defined locally by moderators or toward relevant markets and/or technological areas to be further investigated. Moderators’ decision to narrow the search for ideas was motivated by various reasons. First, it aimed at favoring the generation of ideas of relevance to both moderators and the organization itself, in this way increasing the opportunity to realize them as innovations. Narrowing the search enabled moderators to generate “a clear demand for ideas” (Bjork et al. 2014, p. 430) upon which employees can focus their efforts. It thus served the purpose of aligning potential innovations with the overall needs and objectives of the organization. Second, it aimed at making the subsequent screening process less time-consuming by reducing the collection of irrelevant ideas not aligned with desired organizational areas or needs and thus of little or no use. In contrast, we observed that in two cases the search for ideas was not restrained toward targeted areas. These moderators opted for a more general, unfocused approach aiming at collecting unsolicited ideas (Alexy et al. 2012). This was to provide employees with the freedom and autonomy to generate ideas

without biasing them toward a specified direction. This is exemplified by the following quote,

*“We don’t want to specify types of ideas; we want an idea that would give us some improvement. So we don’t care if it’s an idea, you know, give me a better tool, you can program this better, as long as that idea will show positive business case, we will save some money or gain some money in some areas...so we don’t want to focus people on something, we want them to be as creative as they want.”*  
(Box manager, idea box 1)

At the same time, the use of an unstructured approach increased the probability of identifying valuable ideas that could be implemented. However, we observed that such an undirected search determined negative consequences on the quality of the ideas provided. Moreover, it created challenges for moderators in terms of handling a large amount of ideas, which in many cases were not aligned with organizational needs or objectives. These challenges emphasized the need for moderators to restructure the scope of their idea boxes, by increasing the focus toward more specific organizational areas.

Finally, we discovered that the search for ideas differed not only in terms of its directionality, but also in terms of its geographical scope. We identified an important tension between a broad and narrow search focus. In some cases, the search was conducted more broadly across the whole organization and thus in more distant manners. This was mainly to enable the large and diverse crowd of widely distributed employees to generate ideas or solutions (Jeppesen and Lakhani 2010). In other cases, instead, it was conducted with a narrower focus, targeting a specific region, country or business unit. Moderators aimed at targeting only those employees deemed as having the right competences or knowledge to provide relevant ideas.

### **Stimulating Ideas**

We discovered that most moderators were actively involved in stimulating the generation of new ideas and solutions through the use of two main mechanisms: (1) performance targets as a directive mechanism; and (2) monetary and non-monetary incentives.

More specifically, we identified an important tension between the use of performance targets and incentive mechanisms. Interestingly, we found that in eight cases moderators employed performance targets (KPIs) as a way to drive employees' motivation. As such, active participation in the idea box constituted an important part of the employee personal evaluation and was tied to the achievement of a specific goal. Moderators established different types of performance targets at the individual and at various organizational levels, to ensure both individual and organizational accountability for defined targets. In general, we observed that the use of performance targets served multiple purposes. First, it enabled moderators to ensure a continuous inflow of ideas as well as increase employees' awareness about innovation. Second, measuring employees' performance in terms of number of accepted or implemented ideas was regarded as a way to push employees to further develop submitted ideas. Third, the use of targets represented a way to report ideation performance to management. As explained by a moderator,

*“We need to have some type of KPIs, it's more management, higher level management perspective. We have this sort of justifying, monetizing, in some way quantifying what we actually are doing. So that's why we came up with these KPIs, to show this towards higher level management.”(Moderator, idea box 1)*

However, although ensuring a continuous inflow of ideas, the use of performance targets created various challenges for moderators. Several interviewees reported that in many cases employees felt the pressure to generate ideas only for the purpose of reaching the established targets. As such, targets hindered their intrinsic motivation to participate and fostered dissatisfaction among employees. Consequently, this pressure determined negative consequences on the quality of the ideas provided, which in many cases resulted in poor output. Several moderators decided to couple the use of performance targets with the provision of both monetary and non-monetary incentives. This was mainly to further motivate employees to achieve their performance targets by providing prizes and recognition to them for their achievements as well as by making participation fun through the use of

gamification principles (Deterding 2011). As such, it constituted a way to leverage both employees' intrinsic and extrinsic motives (Amabile 1997). On the contrary, we observed that other moderators did not use performance targets, as they believed it did not constitute the right means to drive employees' motivation. As reported by a moderator,

*“We put some prizes, we put some commitment...we ask people that, when they submit, they will create ideas and not just trivial ideas or that they're doing it because they've been pressured for their personal performance. So I want to put recognition so that people would participate, it would be fun and some prizes...KPIs, that goes against what innovation is all about.”(Moderator, idea box 13)*

Instead, they developed a reward system based on the combination of both monetary and non-monetary incentives. In many cases, this system was developed around a points-based system. Monetary rewards were then coupled with the provision of virtual medals, symbolic gifts or certificates to recognize employees for their achievements. This was considered crucial to increase employees' engagement by ensuring their visibility as innovators. Finally, we observed that in eight cases moderators did not employ any mechanism to stimulate idea generation. Although in some cases such stimulation occurred in more informal ways, these moderators were not actively involved in this activity. This was mainly due to two reasons. First, lack of time and work-load pressure constituted difficult obstacles affecting their involvement. Second, stimulating the generation of ideas was not regarded as a critical task in their role as moderators. However, this lack of involvement determined a low level of employees' engagement and usage of their idea boxes.

### **Screening and Selecting Ideas**

*“What we do is the screening of the ideas that are submitted to this idea box with the objective to identify those ideas may be worth taking a little bit further and help the innovators to do so.”(Moderator, idea box 11)*

Screening and evaluating ideas was regarded as a critical task of moderating ideation. It is argued that the way these activities are executed may have an impact on the innovation process (Byrne et al. 2009). In our case we observed different types of evaluation

mechanisms established by moderators, namely: (1) a formal decision making process; (2) an informal evaluation process; and (3) the relinquishing of ownership to selected assessors.

First, we found that several moderators assumed a proactive role during the idea evaluation process. Some moderators established a formal decision making process, during which ideas were screened and selected by an innovation board constituted by a number of moderators with different areas of expertise and competences. This ensured that ideas were discussed and evaluated from various angles and perspectives, thus favoring diverse inputs. Often, these innovation committees included the participation of senior management to gather needed support and resources to take valuable ideas further for implementation. Second, we observed that other moderators did not establish a formal decision making process but instead performed the evaluation in more informal ways. This especially occurred in small unit-level ideas boxes, where it was diffused practice to informally discuss ideas with other employees and, subsequently, select those to take further for implementation. Finally, in two cases moderators acted as administrators or coordinators. Their role consisted in defining the evaluation process, including the criteria and the people in charge of the evaluation, as well as in ensuring that the evaluation was conducted in the intended way. These moderators performed the initial screening of the ideas and, subsequently, transferred them to relevant assessors with the right competences and expertise to evaluate them.

Together with the screening and evaluation of ideas, we found that the provision of feedback constituted a critical task for moderators. This was mainly to: (1) signal to employees that their ideas were taken into serious consideration; and (2) sustain their engagement and participation. Most moderators dedicated time and efforts in providing a constructive feedback to employees in a timely manner, where they explained how to further develop and

improve an idea as well as the reasons for its acceptance or rejection. As reported by a moderator,

*“We don't say we don't like the idea - we have found ideas that are already in development or have been already considered in the product, or that are not applicable at that time...I think that this is not a negative feedback, it is a type of feedback that says that the idea is not going to go further, that is not going to be implemented because is in the product, because is already there and so on. So, more than negative feedback, we provide explanations about why this idea is not going to go further.”(Moderator, idea box 11)*

Finally, we noticed that in three cases moderators did not establish any process for evaluating ideas nor for providing feedback to employees. This mainly occurred because of the lack of time and motivation to handle such processes or because it was not regarded as a critical activity in their role. These moderators played a more passive role and did not actively utilize their idea box to handle ideas. This, however, affected the performance of their idea box and employees' ideation efforts.

### **Developing and Championing Ideas**

We found that moderators play a crucial role in managing the idea development phase, by providing guidance and support to employees to further improve their ideas. Their involvement in this phase occurred before, during and after the evaluation process. In some cases, for instance, moderators organized events or workshops where employees could present and discuss their initial ideas before submitting them into their idea box. These initiatives helped employees frame their ideas in a way that was more aligned with organizational strategies and goals (Mumford et al. 2002) as well as they contributed to improve their formulation. In other cases, personal discussions were conducted with employees to seek clarifications about their ideas, gather additional information as well as provide suggestions about how to further improve them before the final selection decision. Other moderators established a more formal process consisting of an experimentation week. During this week, employees were provided with needed resources to further advance and

develop their ideas. Moderators could then select the most valuable ideas and provide additional resources for their development. Finally, we observed that several moderators were actively involved in helping employees prepare presentations of their ideas or create a solid business case to sell them in front of the reviewing committee.

Hence, we found that during this phase moderators acted as champions of new ideas (Howell and Boies 2004), by gathering management support and resources needed to advance valuable ideas and promote them across the organization (Mumford et al. 2002). In relation to this, the work of Dutton and Ashford (1993) on issue selling may offer some insights into the activities performed by moderators in this phase. The authors highlight two important aspects of issue selling. The first, called ‘packaging’, relates to the way individuals frame an issue (Dutton and Ashford 1993). The authors suggest that issue selling efforts tend to be more successful when linked to key organizational aspects (Dutton et al. 2001). In this respect, Howell and Higgins (1990) posit that champions can frame an innovation by emphasizing certain organizational aspects that are likely to attract managers’ attention. Such framing may then play a key role in gathering management support for the innovation and needed resources (Howell and Boies 2004). We found evidence of these arguments in our study. In fact, moderators tried to emphasize strategic and business-oriented aspects during the idea maturation process as a way to gather support. For instance, they focused on promoting an idea by justifying its costs or highlighting its potential benefits for both the customers and the organization, thus as a way to increase its acceptance. As explained by a moderator,

*“We create a business case; we contact several other people who are maybe more expert in this area which the idea is referring to...And then if we see that the idea actually makes sense and that we can make out of something, we make this small material in the power point. It’s a couple of slides when we make summary of the idea, how it should be implemented and the business case which is very important, what is announced on investment needed, because it’s usually something to develop. It’s usually something to change which has some cost. And what is the benefit, how much savings we will achieve with this new process, this new implementation.”(Moderator, idea box 1)*

The second aspect of issue selling is related to the channels (formal and informal) that individuals use to promote new ideas (Howell and Higgins 1990; Howell and Boyes 2004). We found that moderators relied on multiple channels in their promotion attempts. For instance, they focused on building support for valuable ideas by presenting a business case to the management committee, by organizing events where employees could present ideas to management, or through formal meetings with relevant managers. At the same time, they discussed ideas more informally with other key managers. These channels were not only employed to identify sponsors willing to sustain the implementation process with needed resources, but also to gather needed competences and expertise for further advancing ideas.

## **5. Discussion**

The findings of this study provide a detailed account of how the ideation process is moderated and managed in the context of a web-enabled ideation system. We found that moderators organize and manage the different front-end activities in a distributed manner by exercising both “upward and downward influences” (Floyd and Wooldridge 1992, p. 154). While Floyd and Wooldridge (1992) discuss these influences in the context of managers’ strategy making, we found that both types of interventions are crucial for moderators in order to properly manage the front-end of innovation when using ideation systems. On the one hand, they play a crucial role in fostering the generation and development of new ideas and solutions, thus displaying some level of leadership behavior toward the other employees. On the other hand, they attempt to influence higher level management by championing valuable ideas in order to attract support and resources to realize them as innovations. Moreover, our findings highlight that moderators adopt various approaches and mechanisms to manage the ideation process. This variety suggests that moderators display different behaviors and views toward ideation. This is also explicated in the different levels of commitment displayed when executing their role. We observed that these differences both in terms of commitment and

approaches to managing ideation seem to determine consequences (intended or unintended) on ideation performance. We thus build on the previous section to further discuss and theorize about our research question. First, we draw on research on role orientation to further understand moderators' role and, more specifically, why we observe differences in terms of commitment and approaches to ideation. We argue that drawing on such literature may provide valuable insights into how the ideation process is moderated by these actors as well as it may partly contribute to explain observed differences in the ideation performance. Second, our analysis suggests that moderating ideation presents a number of paradoxical issues that need to be properly managed. More specifically, we discuss three main issues emerging from the analysis: (1) search behavior focus; (2) extent of direction in driving search behavior; and (3) goal setting to influence employees' efforts.

### **5.1. Moderators' Role Orientation and its Effects**

Our findings suggest that, when it comes to managing the ideation process, moderators view their role in a different way. In this respect, valuable insights can be derived from the literature on role orientation. Parker et al. (1997) introduced the concept of flexible role orientation to highlight how employees should develop a broader view of their organizational role. This entails a shift from a "that's not my job view" (Parker and Axtell 2001, p. 449) to a more flexible view in which employees can assume wider responsibilities (Parker and Axtell 2001). In relation to our case, we observed differences among moderators in the way they constructed their own role. On the one hand, we found that active moderators developed a more flexible view of their role. In fact, they were actively engaged in various activities deemed as crucial to manage the whole ideation process. Moreover, they considered important to develop the necessary expertise to ensure the alignment of ideas with organizational strategies and objectives (Mumford et al. 2002; Howell and Boies 2004). As such, reframing the activity scope emerged as a key task for moderators, looking beyond

present responsibilities. On the other hand, we observed that passive moderators developed a more limited view of their role, feeling responsible for a limited set of activities. However, such view led them to discard crucial activities when managing ideation, such as motivating employees to generate ideas, establishing a process for their evaluation or developing and championing them. Consequently, their lack of involvement in these key activities determined negative consequences on the performance of their idea boxes.

We suggest that one important factor influencing how broadly and actively moderators manage the ideation process is their initial motivations to cover this role. We found that active moderators displayed high levels of intrinsic motivation in driving ideation efforts. Intrinsic motivational factors such as enjoyment, interest in innovation, interest in being exposed to others' ideas or the desire to be part of the broader organizational strategy, constituted main drivers in their decision to become moderators in the first place. As such, they considered crucial in their role to perform the four outlined activities effectively in order to foster and sustain ideation performance. In contrast, less active moderators reported that they were 'forced' to assume this role by their superiors, hence lacking the inner motivation and commitment to manage the ideation process. We observed that this lack of motivation contributed to constrain the range of activities they decided to engage in and, in the extension, negatively affected the performance of their idea boxes. Furthermore, Parker et al. (1997) refer to flexible role orientation as a dynamic concept that can evolve over time. This was evident in our study, where we observed changes to role flexibility occurring in two different directions. On the one hand, flexible role orientation was limited by available time for innovation and work overload. In some cases, the limited amount of time and available resources as well as short-term work deadlines constrained the range of activities moderators were able to engage in. Hence, this led some moderators to prioritize their present responsibilities over the management of their idea boxes, by reducing the types of

interventions conducted. On the other hand, we observed that increased motivation, gathered from working with idea boxes at a managerial level, helped some moderators move in the opposite direction. Thus, it contributed to expand the activities they focused on when managing ideation as well as to improve their understanding of the organizational strategy (Parker et al. 1997). Collaboration and communication practices with other moderators also contributed to expand this narrower view.

Overall, this discussion suggests that differences in the innovative performance of the idea boxes may be partly explained by how moderators view their own role. This is in line with other innovation studies, which emphasize how developing a flexible role orientation may be crucial for organizations' performance (Lawler 1994; Parker 2000). In this respect, Parker et al. (1997) highlight the importance for employees to contribute to their organization in new ways by engaging in activities that are not part of their daily responsibilities, an aspect they label 'production ownership'. At the same time, they need to "recognize the importance of acquiring a wide range of skills and knowledge to be able to contribute at that broader level" (Parker et al. 1997, p. 901).

Together with role orientation, our findings suggest that moderators' initial motivations and available time for innovation constituted two important antecedents influencing the way the ideation process was managed and, in the extension, ideation performance. It is argued that organizations should provide employees with enough time to engage in ideation activities (Bjork et al. 2010). This becomes a particularly salient aspect for moderators. In fact, in some cases the lack of time for innovation contributed to constrain the types of activities moderators engaged in, thus leading to more passive approaches when managing ideation. As such, we argue that flexible role orientation and motivation are not sufficient if moderators are not provided with enough time to dedicate to their role. Hence, these considerations led us

to develop a more comprehensive model of how the ideation process is moderated and managed when using web-enabled ideation systems. This model highlights moderators' role orientation, initial motivations and time available for innovation as three key antecedents of moderating ideation. Figure 2 depicts this model.

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

In our model we distinguish between different types of interventions when moderating ideation, directed at influencing both employees and higher level management. We argue that both types of interventions are crucial to effectively manage the early phases of the innovation process in a distributed manner. This relates to a distinction in current literature between creating and realizing innovation potential. For instance, Jansen et al. (2005) emphasize the importance for organizations of not only creating new knowledge, but also of being able to absorb it and use it. Along the same line, we suggest that idea generation and idea realization represent two crucial dimensions of the innovation process. As such, if moderators solely focus on the search and generation of new ideas, this may determine negative effects on the subsequent innovation performance as ideas do not become realized as innovations. Conversely, if moderators focus only on developing and implementing ideas, they may not be able to access the diversity of inputs favored by search activities (Jansen et al. 2005). Hence, supporting ideation in web-enabled ideation systems requires that both dimensions are simultaneously taken into consideration as well as actively managed by moderators.

## **5.2. Unpacking Paradoxical Issues**

Our analysis suggests that moderating ideation presents three paradoxical issues that need to be properly addressed, namely: (1) search behavior focus; (2) the extent of direction in driving search behavior; and (3) goal setting to influence employees' efforts. To unpack each

paradox, we discuss its underlying tension and corresponding moderators' strategies to manage it.

***Search behavior focus.*** A crucial question when moderating ideation relates to whether the search for ideas should be conducted broadly across the whole organization or in a narrower manner. In our case, we found that moderators differed in their search behavior focus. This was evident in their decision to create either idea boxes aiming to collect ideas from all employees or with a narrower focus, thus targeting only a limited number. Research emphasizes the importance of conducting a broader, more open search for ideas and solutions to access a wider diversity of inputs and perspectives held by distributed individuals (Terwiesch and Xu 2008; Jeppesen and Lakhani 2010). In relation to our case, we found that a broader focus - although favoring access to diverse inputs and to a large amount of ideas - created different challenges to moderators. First, involving all employees in ideation determined challenges in the evaluation process, due to the large amount of ideas to be considered. As a consequence, moderators may be able to focus only on a limited number of ideas to move further for implementation (Koput 1997). Second, we observed that a broader search focus may lead to more incremental innovation, as many of the ideas generated were considered by moderators as having limited quality or novelty. On the other hand, it is argued that a more closed approach may be useful when organizations have identified both key contributors from whom to collect ideas and the areas to be investigated (Pisano and Verganti 2008). Moreover, with a narrower search focus it becomes easier to evaluate ideas and to allocate needed resources and attention for their further development (Pisano and Verganti 2008). This was evident in our study, as some moderators restrained the search to a limited number of employees due to their belief that: (1) the targeted part of the organization possessed the right knowledge and expertise to generate and develop relevant ideas; and (2) it was easier to attract and allocate resources for their maturation. However, it is also argued

that a more closed approach may limit the access to more diverse and novel inputs, as organizations may end up searching in domains already familiar to them (Dearborn and Simon 1958). As such, they may lose more radical opportunities (Bjork et al. 2010). This points to the necessity to consider different types of knowledge creation processes in innovation, as the prerequisites for in-depth analysis and new combinations between diverse sets of knowledge, respectively, vary greatly (Bergendahl and Magnusson 2015). Consequently, depending on the specific innovation needs, different search behaviors will be more or less suitable. This discussion suggests the importance of combining the two search behaviors by finding ways to link their potential synergies. Hence, it leads to the necessity for organizations to reach ‘contextual ambidexterity’ by enabling moderators to simultaneously manage both activities (Birkinshaw and Gibson 2004). Relatedly, we argue that moderators may be regarded as ‘ambidextrous individuals’ (Birkinshaw and Gibson 2004), who possess the flexibility and authority in their role to make choices about their search focus. At the same time, they possess the flexibility to adjust their search behavior in accordance to changing organizational needs or objectives. In fact, they have the possibility to close existing idea boxes, open new boxes or reframe the search focus of existing ones. Hence, they may contribute to the ideation process by fostering “an emergent search behavior” (Bjork et al. 2014), which can be flexibly adjusted to fit organizational needs and objectives. However, we posit that reaching contextual ambidexterity also requires organizations to help moderators make a correct evaluation and decision, especially when there is no clear focus for ideation.

***Induced and spontaneous search behavior.*** When analyzing search behavior, another important tension relates to whether organizations should provide direction for ideation efforts or not. We found that moderators tended to direct employees’ search behaviors toward desired focus areas or innovation needs deemed as most crucial. This was considered

important to align employees' ideas with organizational objectives and strategies. Our findings suggest that the provision of direction plays an important role from an organizational perspective, as it increases the possibilities to realize ideas as innovations. As such, it constitutes a beneficial approach to obtain ideas which are more relevant for an organization and with a better quality (Nonaka and Takeuchi 1995; van den Ende et al. 2014). However, our findings suggest that excessive direction may determine counteractive effects. It may lead to more incremental innovation and thus limit the possibilities to explore more radical opportunities (Bjork et al. 2010). This may happen because "induced strategic behavior fits in the existing categories used in the firm's strategic planning and takes place in relation to its familiar environments" (Burgelman 1983, p. 1350). Hence, it may hinder employees' freedom in their search efforts and then potentially disruptive innovations (Christensen 1997). On the other hand, a lack of direction is argued to be important as it provides organizations with the "raw material for strategic renewal" (Burgelman 1983, p. 1350). Thus, it may favor the generation of more radical or novel ideas (Burgelman 1983; van den Ende et al. 2014), as employees can search in more distant terrains. It may then contribute to foster a culture in which employees feel free to share and mature each other's ideas (van den Ende et al. 2014). However, it is also argued that bottom-up approaches may be problematic because they may lead to the generation of ideas not focused on a particular goal or need (Gamlin et al. 2007) and thus of little use. Moreover, they may create challenges in the subsequent screening process (Gamlin et al. 2007), due to the larger amount of ideas that can be generated. This was evident in our study, where the lack of direction created challenges for some moderators in terms of handling a large amount of inputs. At the same time, it determined negative consequences on the quality of the ideas generated.

Overall, this discussion suggests the importance for organizations to understand how to adjust their ideation systems to simultaneously balance both behaviors. As stated by van den Ende

et al. (2014, p. 1), “innovation management can be regarded as a balancing act between creating a supporting and stimulating context and setting direction and focus”. In this respect, moderators may play a crucial role in combining direction and empowerment, as they possess the flexibility and authority to reframe the scope of their idea boxes in ways that allow for both approaches to subsist. As such, they have the possibility to decide how to manage the interplay between direction and freedom according to their needs and objectives. This could also, for instance, entail the use of “subtle means of control” (Dahlander and Magnusson 2005, p. 490), which moderators can use as a way to influence employees’ ideation efforts so that they are more aligned with the organization’s strategy, while at the same time allowing for sufficient autonomy and freedom.

***Goal-setting and clarity.*** Our study identifies another important tension which has not previously been thoroughly addressed by the innovation management literature: whether to engage employees in ideation efforts through the use of performance targets or incentives. We found that the use of performance targets constituted an important mechanism to influence employees’ behavior by setting specific goals for their ideation efforts. The employment of performance targets can be related to a broader discussion in current literature about goal-setting in creativity and innovation. In general, various scholars have investigated how organizations can employ goals as a way to motivate employees (Locke and Latham 1990). It is claimed that goals influence employees’ motivation as they tend to direct their efforts and attention toward the achievement of predefined targets (Locke and Latham 1990). However, it is not clear whether goal-setting may be applied in an innovation context and, more precisely, how it may affect employees’ innovative behaviors and outputs (Carson and Carson 1993; Shalley 1995). Some studies show that creativity goals have a positive effect on idea generation (Shalley 1991; Shalley 1995), especially because they help clarify managers’ expectations toward employees (Amabile et al. 1996). In relation to our study, we found that

performance targets were employed as a way to measure employees' innovative performance and thus to drive a desired behavior. As such, they constituted a control mechanism through which moderators aimed to stimulate employees to act in desired ways, by making them accountable for their outputs and contributions to the system. However, we argue that employing performance targets as a directive mechanism may be problematic. In fact, our findings suggest that performance targets may drive a behavior which is not always desired by moderators, leading to poor ideation outcomes especially in terms of quality of the ideas generated. We observed that they tended to diminish creativity and foster employees' dissatisfaction, thereby contributing to inhibit their motivation to participate. Hence, these considerations lead us to the suggestion that performance targets may constitute a 'lazy' mechanism employed by moderators to stimulate employees' participation. This is because the definition of targets may render the task of engaging employees easier to accomplish, by linking it to the achievement of predefined goals. In contrast, providing incentives requires more efforts on the side of moderators and it becomes more difficult to engage employees on a continuous basis. It requires consistent efforts and resources to create a balanced incentive structure able to sustain employees' motivation over time, with continuous interventions directed at maintaining a higher level of participation. We suggest that building an incentive structure requires moderators to consider two important issues: (1) how to create proper incentives that motivate employees to provide ideas aligned with the innovation needs or areas defined by moderators; and (2) how to create incentives that motivate employees to contribute in a collaborative manner and thus in line with the collaborative character of the system. At the same time, this discussion opens up the question of whether performance targets should be employed in the context of ideation systems and, if so, how to employ them in a valuable way in order to not inhibit employee motivation. Several moderators tried to integrate the use of performance targets with the provision of various incentives, both

monetary and non-monetary, in the attempt to leverage both employees' intrinsic and extrinsic motives. In line with this, Mumford et al. (2002) posits that combining performance targets with rewards and recognition may prove to be a more successful approach.

## **6. Managerial Implications**

Our study holds various implications for practitioners employing web-enabled ideation systems within their organizations or intending to do so. Our findings may be used to develop guidelines to improve moderators' contributions to the innovation process, especially in terms of: (1) aligning search behavior with the broader organizational strategy and objectives; (2) defining a proper incentive structure to sustain employees' motivation; and (3) developing proper receiving mechanisms to handle ideas. Also, we posit that performance targets may constitute a key instrument to direct employees' behavior if utilized in the right way. One possibility may be to change the types of goal measures employed by moderators according to the maturity achieved in the idea box. This would entail, for instance, a shift over time from measuring the number of submitted ideas, to accepted ideas, and eventually the value generated by these ideas. Such change may help employees learn over time the types of ideas to submit, what constitutes good quality as well as further work on their ideas to understand their value. Performance targets may be employed as a self-training mechanism for the community of employees and thus as a way to nurture the right behavior. Finally, we posit that moderators' role requires careful consideration of a set of important aspects, namely: (1) the development of a flexible role orientation. The provision of specific training initiatives may be beneficial to educate moderators on the types of activities to focus on as well as develop the necessary skills and knowledge; (2) Motivation and commitment to their role. As moderators are not always intrinsically motivated, we suggest the creation of proper incentives to motivate moderators to effectively manage the ideation process; (3) Expertise, in order to be able to align ideas with organizational strategies and objectives and help

employees further develop them; and (4) Time for innovation, in order to manage the ideation process in a proper way.

## **7. Conclusion**

As organizations become less hierarchical and progress toward flatter community structures (Adler et al. 2008), employees at different hierarchical levels have the possibility to contribute in new ways and with different roles to their organizations. Moderators represent an emerging set of actors empowered by organizations with the decision-making authority to support and drive ideation in web-enabled ideation systems. Our study sheds more light on how the ideation process is managed and moderated by these emerging actors. The present study contributes to the innovation management literature in three ways. First, we provide important insights on moderating ideation, advancing scholars' understanding about the role played by moderators in web-enabled ideation systems. We found that moderating ideation entails different types of interventions directed at properly managing the front-end of innovation in a distributed manner. Second, our conceptual model identifies key antecedents of moderating ideation. Assessing these antecedents may contribute to a better understanding about how the ideation process is moderated and thus may partly explain subsequent consequences on ideation performance. Third, we contribute to the current discussion about tensions in the front-end of innovation by shedding more light on three key paradoxical issues emerging when moderating ideation and on moderators' strategies to manage them. Relatedly, we identified a new tension between the use of performance targets and incentives which has not been previously addressed by innovation literature. A better understanding about whether and how to employ performance targets as well as how to combine them with incentives is thus important in order to nurture the right behavior from employees and engage them in innovation. Overall, our study has implications for innovation management scholars because it shows the importance of investigating moderating roles when it comes to ideation.

Exploring how the ideation process is moderated by these emerging actors may also contribute to a more detailed understanding of how these systems can be maintained and sustained over time as well as partly explain why we observe differences in their performance levels. The paper also has limitations which provide opportunities for future research. In particular, the use of a single case study may raise issues about the generalizability of our findings (Lincoln and Guba 1985). However, the selected organization constituted an ideal case for more clearly understanding the moderation of ideation. Future research could investigate whether our emerging conceptual model may extend to other settings and whether moderators in other organizations display different characteristics or employ different mechanisms to moderate ideation and manage emerging tensions. Moreover, more research is needed on the characteristics of these facilitating roles, their goals, behaviors and motivations, much in line with the increasing attention placed by current research on the micro-foundations of innovation.

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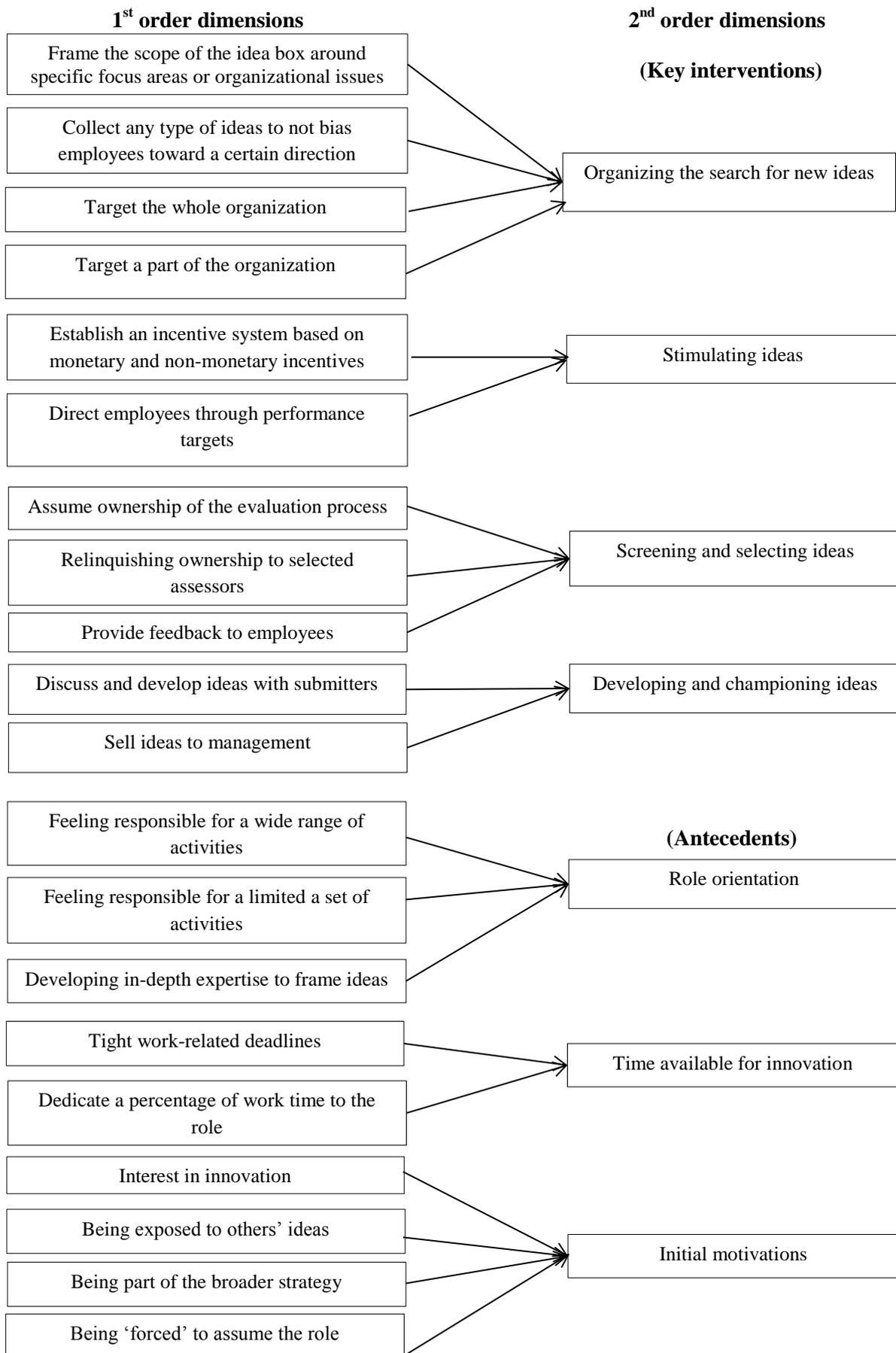
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**Table 1. Overview of Selected Idea Boxes**

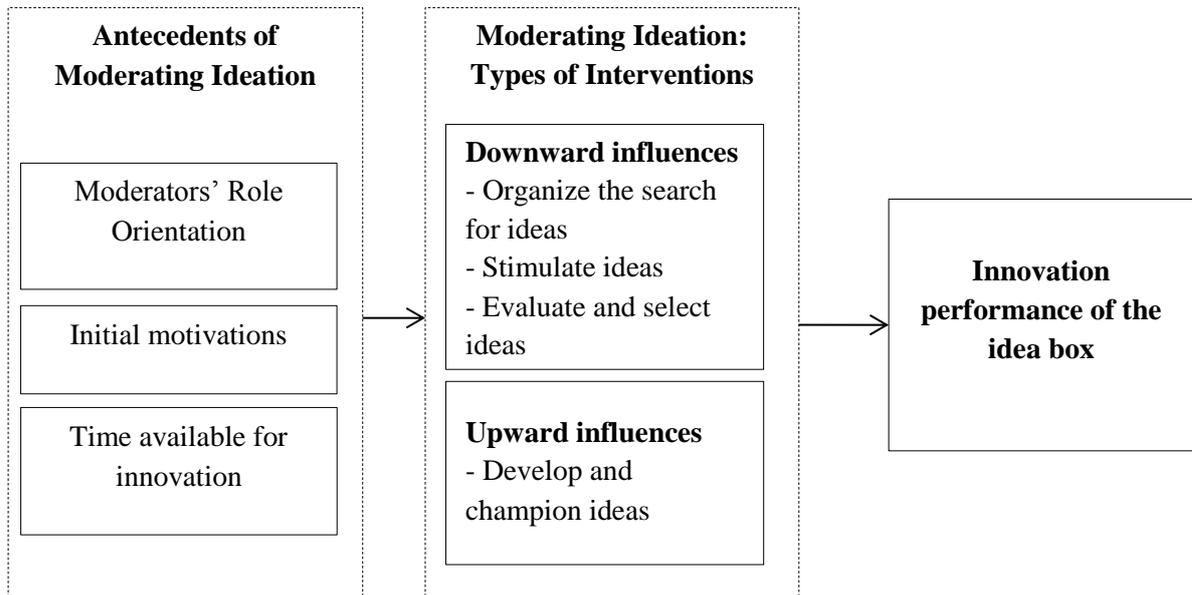
<b>Idea box ID</b>	<b>Idea Box scope (geographical)</b>	<b>Idea box type</b>	<b>N. of moderators interviewed</b>	<b>Idea box performance*</b>
1	Country level	Organizational - Unfocused scope	3	High
2	Unit level	Organizational - Focus areas	2	High
3	Unit level	Organizational - Focus areas	1	Medium
4	Unit level	Organizational - Focus areas	1	Medium
5	Unit level	Organizational - Focus areas	1	Low
6	Unit level	Organizational - Focus areas	1	Low
7	Unit level	Organizational - Focus areas	1	Low
8	Unit level	Organizational - Focus areas	1	Low
9	Unit level	Organizational - Focus areas	1	Low
10	Country level	Organizational - Unfocused scope	1	Closed
11	Global	Organizational - Focus areas	2	Medium
12	Global	Organizational - Focus areas	1	High
13	Global	Organizational - Focus areas	2	High
14	Global	Organizational - Focus areas	2	High
15	Global	Problem-driven	1	High
16	Global	Organizational - Focus areas	1	Low
17	Global	Organizational - Focus areas	1	Low
18	Regional	Organizational - Focus areas	1	Medium
19	Regional	Organizational - Focus areas	1	Medium
20	Global	Organizational - Focus areas	1	Low

\*This classification is based on an algorithm employed by the company to assess the performance of each idea box. This algorithm takes into account both quantity and quality of the ideas generated, activity levels in the idea box as well as number of selected and implemented ideas. Detailed documentation was provided by the company with a full account of the ranking of all the idea boxes.

**Figure 1. Data Coding**



**Figure 2. A Conceptual Model of Moderating Ideation**



## Appendix

### 1.1. List of Interviewees

ID	Job title	Idea box - Role	Box ID	Lenght	Data collection
1	Innovation manager	Overall moderator	1	1h 14 min	Phone interview; one researcher; Recorded
2	Innovation manager	Co-moderator	1	1h 5 min	Phone interview; one researcher; Recorded
3	Team leader	Moderator	14	1h 6 min	Phone interview; one researcher; Recorded
4	System manager	Moderator	11	55 min	Phone interview; two researchers; Recorded
5	Technology program manager	Co-moderator	11	55 min	Phone interview; two researchers; Recorded
6	Software developer	Moderator	15	52 min	Phone interview; two researchers; Recorded
7	Strategic product manager	Moderator	20	30 min	Phone interview; two researchers; Recorded
8	Innovation driver	Founder of the system	/	1 h 24 min	Face-to-face interview; two researchers; Recorded
9	Section manager	Overall moderator	2-10	47 min	Face-to-face interview; one researcher; Recorded
10	Team leader	Moderator	2	50 min	Face-to-face interview; one researcher; Recorded
11	Software developer	Co-moderator	9	41 min	Face-to-face interview; one researcher; Recorded
12	Innovation driver	Co-moderator	5	36 min	Face-to-face interview; one researcher; Recorded
13	System engineer	Moderator	3	1h 5 min	Face-to-face interview; one researcher; Recorded
14	Assistant	Moderator	6	38 min	Face-to-face interview;

15	Developer	Moderator	7	1h 22 min	one researcher; Recorded Face-to-face interview;
16	Project manager	Moderator	10	47 min	one researcher; Recorded Face-to-face interview;
17	Software developer	Moderator	4	53 min	one researcher; Recorded Face-to-face interview;
18	Software developer	Moderator	8	53 min	one researcher; Recorded Face-to-face interview;
19	Open platform development manager	Moderator	18	45 min	one researcher; Recorded Phone interview;
20	Innovation manager	Overall moderator	12	1h 5 min	one researcher; Recorded Phone interview;
21	Innovation coach	Moderator	1	53 min	one researcher; Recorded Phone interview;
22	Improvement officer	Moderator	16	58 min	one researcher; Recorded Phone interview;
23	Innovation driver	Moderator	13	38 min	one researcher; Recorded Phone interview;
24	Line manager	Co- moderator	14	30 min	one researcher; Recorded Phone interview;
25	Innovation driver	Co- moderator	13	48 min	one researcher; Recorded Phone interview;
26	Section manager	Moderator	19	38 min	one researcher; Recorded Phone interview;
27	P&O manager	Co- moderator	17	44 min	one researcher; Recorded Phone interview;
28	Director New Business Development & Innovation	Founder of the system	/	/	Informal interviews

## 1.2. Data Table with Coding Logic for Comparisons across Idea Boxes

1 <sup>st</sup> order and 2 <sup>nd</sup> order dimensions		Representative Data
<b>Organizing the search for new ideas</b>	Frame the scope of the idea box around specific focus areas or organizational issues	<p><i>“We have reused this concept of idea box within the operation for xxx and we have set idea box for the different region, so I'm currently at xxx, there are other regions, four regions within xxx, and this web-based application is a way for people to submit the title of their idea, put a description, what would be the impact of having this idea in their organization, then the cost-savings, also maybe new ways of doing things to improve efficiency within your group or maybe within your task.” (Moderator, Idea Box 18)</i></p> <p><i>“We’ve been trying to educate people around what sort of ideas we would like to see in our idea box, trying to educate people that we are a service division within xxx, that we have more influence on services type of organizations. So at least within our group we are trying to show the type of ideas we are looking for...It doesn’t mean that other ideas don’t get off the ground, but within our box we want to try to specialize an idea around certain areas like services and things like that” (Moderator, Idea Box 11)</i></p> <p><i>“We also try to be guided to which areas we appreciate ideas mostly... Just to try to get the people thinking the direction that we thought would be much</i></p>

		<p>viable”.(Moderator, Idea Box 16)</p> <p>“What we do is through challenges. The head of the organization sends out a challenge. I need to get ideas for this problem. And then a solution. Then the unit is linked to a specific idea box and then the employee will go there to submit ideas. It’s very effective.” (Moderator, Idea Box 15)</p>
	<p>Collect any type of ideas to not bias employees toward a certain direction</p>	<p>“Now we have a box that is on the level of 1600 people, then we are getting synergy and comments, and this cooperation among all people working in the company. So going to smaller boxes is not really productive, this is also about going with a huge number of people, huge number of ideas. Although there was a lot of discussions why we didn’t have a box around technical areas, instead of having it organized for the site.” (Moderator Idea Box 1)</p> <p>“We are encouraging people to submit whatever they have. So it’s better to submit ideas then not submit ideas. Even if the idea is stupid, I always said to them, when I promote this idea, I said, don’t worry about the idea. If you have an idea submit it, if it’s stupid I will get back to you and say it’s stupid, but submit it, because maybe behind this idea there is something big. So I’m encouraging people to submit whatever idea they have.” (Co-moderator Idea Box 1)</p>
<b>Stimulating ideas</b>	<p>Establish an incentive system based on monetary and non-monetary incentives</p>	<p>“We do try to promote rewards and recognition where is possible. It’s quite often trying to give gift cards and something like that, some sort of points or something, for people once they achieve something, so maybe they have a gold idea that has been implemented or a very big idea that got a certain stage of implemented or they reached a certain point in their implementation and we try to keep encouraging them.” (Moderator, Idea Box 14)</p> <p>“So we do send a lot of newsletters, we do send letters telling who is innovating, what are the top 10 people who get the maximum points, we do recognize people. And we do recognize people in a timely manner, we send them newsletters, with the pictures that these are the people that are making the difference”. (Moderator, Idea Box 12)</p> <p>“Unfortunately we don't have a motivation system...we check at other units, and we try to implement this in our unit. And it contains for example mini-team building, some little prizes, if somebody made a good idea for example. But we are working on it, so it's not finished.” (Moderator, Idea Box 5)</p> <p>“So one of the motivations is to...we have a rewarding process, established inside this innovation process. So, for every accepted idea you would get either some points or if the idea is very good you will get some financial award” (Moderator, Idea Box 1)</p>
	<p>Direct employees through performance targets</p>	<p>“Yes, every month I have to produce, I have to collect the data within the idea box, how many ideas have been submitted that month, how many have been implemented throughout the year and I do a report” (Moderator Idea Box 18)</p> <p>“I would say the response has been a bit low due to the fact that people told me that they do not want to participate, because they feel like they've been pressured and it shouldn't be that.” (Moderator, idea box 18)</p> <p>“We have a KPI to the team. So we have a KPI in terms of the number of ideas that you need to submit, one idea should be approved, we have been giving certain KPIs which will actually motivate people to put their ideas.” (Moderator, idea box 12)</p> <p>“So that’s the first target, how many people are involved anyhow in submitting the ideas and commenting the ideas in the box. The second target is how many of the submitted ideas are accepted ... As a third target, we have</p>

		<p><i>the target how many ideas we have successfully implemented.” (Moderator, Idea box 1)</i></p> <p><i>“What we would like to achieve with this KPIs is it motivate people to innovate. This whole innovation process is really young in our organization, because it is somehow 2 years old or something like that, so we just wanted to show our people that innovation is a good thing, wanted to make them contribute in innovation... with this KPI that everybody should submit at least one idea and implement at least one idea” (Moderator, idea box 2)</i></p>
<b>Evaluating and selecting ideas</b>	Assume ownership of the evaluation process	<p><i>“In our unit we are just 20 people, so we talk to each other, that's how we select ideas.” (Moderator, Idea Box 6)</i></p> <p><i>“All ideas are reviewed by a committee, I have about 16 people from different areas and we meet every once or twice per month depending on the number of ideas and we review those ideas, we review each one of them and present them to this reviewing board” (Moderator, Idea Box 18)</i></p> <p><i>“There is not a process about the selection, so if somebody wants to, is familiar with innovation, he can do it...so it comes from themselves.” (Moderator, Idea Box 7)</i></p>
	Relinquishing ownership to selected assessors	<p><i>“I don't evaluate any idea. We only facilitate the idea movement from the tool box to the respective expert, we have the idea evaluated by the expert...then we select the person, meaning that he evaluates the idea based on certain parameters; we defined 4 parameters for them, the full parameters we use to evaluate ideas. And they evaluate the idea, they screen that idea” (Moderator, Idea Box 12)</i></p> <p><i>“If it's related to quality, the quality manager needs to comment. If it's related to test, the test manager needs to comment. The relevant area manager, they are mandatory to provide comments on the improvement.” (Moderator, Idea Box 16)</i></p>
	Provide feedback to employees	<p><i>“We review each one of them and present them to this reviewing board and if it's been rejected, then I put the comment that people say during that meeting and then I send out an email to the submitters to tell them that the idea has been rejected by the committee for x and y reasons. So I'm doing a complete follow up”(Moderator, Idea Box 18)</i></p> <p><i>“First, we give them a feedback saying what is the reason for saying that this idea is not good, or we cannot take it forward. What can happen in the evaluation is that the person evaluating an idea says that it's a good idea and we take it forward for implementation, he can approve that idea. But he can say that it does not meet one of the criteria for evaluation, he does not approve this idea. If he does not approve this idea, he puts that idea in not approved state. It's very much mandatory to comment and explain why it is approved or not approved” (Moderator, Idea Box 12)</i></p> <p><i>“Our target is that people get feedback on their idea within one month. So that when you submit the idea you get immediate response in the box that your idea has accepted and that will be forwarded to implementation or will be financed for implementation or something like that. Or that you get the feedback that your idea is not accepted because of explanation followed by why it's not accepted. Is it because of technical, it is impossible, too expensive, or bad business case.” (Moderator, Idea Box 1)</i></p> <p><i>“Unfortunately we don't give so much feedback on the ideas, we don't give feedback for small ideas, but I think it can be important.” (Moderator, Idea Box 5)</i></p>

<p><b>Developing and championing ideas</b></p>	<p>Discuss and develop ideas with submitters</p>	<p><i>“I read your idea, can you clarify this, can you clarify that, can we have a small meeting, face to face meeting, so you can explain what you want to achieve with this idea, where did it come from, how did you invent this idea, have you had any troubles with this area where you submitted the idea? So we talk to people, we write the emails, we sit with them with some short meetings, you know, to expand the idea and we give them feedback.” (Moderator, Idea Box 1)</i></p> <p><i>“So there is an experimentation week, the author of an idea can give a first solution or first description of the context of the idea, the context that he proposed to develop in an innovation. So that is the first item that we make up for evaluation, to see if it is something viable, feasible. Then, when the author has carried out this experimentation week, the result of the experimentation week gets evaluated. If the evaluation is positive, the author can be awarded with a second round of developing his idea. In this second round, it is possible to establish, to build a little team that is in charge of getting this idea further in the development.” (Moderator, Idea Box 15)</i></p> <p><i>“If some ideas that I see have big potential, I also contact the author and try to see with him, how can I help from my position to further develop the idea or to promote the idea further in xxx or outside among the costumers”. (Moderator, Idea Box 1)</i></p>
	<p>Sell ideas to management</p>	<p><i>“So when we see that the idea is good, then we sit with the author, we sit with the line manager of the author, we involve whoever it takes to...let’s say, we have this idea, it obviously is a good idea, it saves us time. So then we put the cost for implementing the idea and the profit or saving that we will make. So first of all we need the positive business case. So once you have a positive business case, that is one milestone we need to achieve...then, this means the idea can be accepted. So it doesn’t mean it will be accepted, but it can be accepted”. (Moderator, Idea Box 1)</i></p> <p><i>“Primarily when we go to the leadership team on the high level, we need to have a strong business case on the effort vs the returns” (Moderator, Idea Box 1).</i></p> <p><i>“If somebody needs help, then I will go to him or her and I will help and I will try to help develop the business case of the idea, try to create BPT summaries, because at some point management decision should be made about the idea, so we can implement it or not. And for those decisions we have some kind of formatted description about the idea”. (Moderator, Idea Box 2)</i></p> <p><i>“Sometimes there’s like a great innovation that requires some investment...and when there are some great ideas, I try to talk to management. I work with the submitter to make a nice presentation of their ideas, show the business case, and try to convince management that we need to invest into those” (Moderator, Idea Box 18)</i></p> <p><i>“And after us it’s the innovation steering level or innovation higher level and there we prepare a one-page for the managers, where we have a one page ppt slide, a template where we fill in with important information that the managers need to have, like business case and how much man hours would be needed to implement this idea, to really get their support for implementation or acceptance” (Moderator, Idea Box 1)</i></p>
<p><b>Antecedents</b></p>	<p>Role Orientation</p>	<p><i>“That explains the role of the box manger from my perspective, it’s to talk to people, we had kind of a smart guide for the box manager, which was not written but we always talked about it and we agreed on it, that whenever somebody submits an idea to the idea box, the box manager will go to the guy and discuss about the idea personally”. (Moderator, Idea box 6).</i></p>

		<p><i>"I would define it as sort of a leader, in which I forward the requirements, the KPIs, to inform all the site drivers what is the intention of the KPIs for innovation and try to help those site drivers achieve their KPIs...and xxx and myself are also on board of this global xxx board committee to review those innovations as well" (Moderator, Idea Box 13).</i></p> <p><i>"So that's my role, clarifying the meaning of innovation, how they can talk about innovating on a daily basis. For the next step, as soon as we are committed to that, then it will have to be into a platform and that's exactly when the role of the box manager comes into place. So box managers would not exist with the box if people do not understand what ideally they have to put into that box. So the first role of the box manager is to make sure that he defines the scope of the box correctly and when people, team members come with an idea, you know that you have motivated enough to see the kind of ideas to be submitted to that box. And next goal is the evaluation and see how this works" (Moderator, Idea Box 12)</i></p> <p><i>"My role was basically to help to clean the idea box, if ideas were not relevant to clean up, to take them away or close ideas or counting how many ideas and we make some kind of competition: who puts most of ideas earns some kind of present/gift. But it's always a struggle how to deal with the idea box, especially because we are not technical people, we don't have the same approach and it's always a question, shall we really do this?" (Moderator, Idea Box 9)</i></p> <p><i>"The box is only a tool, so for me it's much more important the whole process...The box is the first thing, you know, that people start with expressing their ideas, but the main thing is the analysis of this idea...The second thing is to analyze it as technical as possible, to impart such idea, to develop such idea. And then the third thing, which is the most important, is the business case behind the idea...And then we decide on the implementation of this idea. So we also need to define the implementation owner that will be responsible for innovating the idea" (Moderator, Idea Box 1)</i></p>
Time available for innovation		<p><i>"No, but I try to make more if I have more time...my work is too complicated, I can do it over time". (Moderator, Idea Box 5)</i></p> <p><i>"I put at least, minimum ten hours, sometimes more, per week. At least ten hours, but it depends." (Moderator, Idea Box 13)</i></p> <p><i>"The project we are doing, the work each and every day, it's like some short-term thing, people have to finish their work for this and that, every deadline, everything is urgent"(Moderator, Idea Box 3)</i></p>
Initial motivations		<p><i>"I didn't decide it...I was appointed as volunteer...we try to rotate the responsibility and so forth, but this year we didn't...I mean, you have to have a name on the paper pretty much, so I took that and tried to drive it" (Moderator, Idea Box 20)</i></p> <p><i>"I was working with system areas which did not cover 100% my curiosity, so I was not...and this innovation was something we started to talk about and we started to talk about how we could boost innovation in the company. (Moderator, Idea Box 6)</i></p> <p><i>"I like innovation, I like to bring new stuff, I like to get people to participate, that's the goal, to get people to participate to this innovation, which is very good for the company" (Moderator, Idea Box 13)</i></p> <p><i>"I think that without becoming a box manager, you cannot actually control the number of idea coming in the idea box. That's my major reason, having done the innovation program, you have to become a box manager for that box</i></p>

	<p><i>to make sure that people give ideas. If I'm not the box manager, then I have no control of which ideas are coming in. or I cannot go and do the claim for interest and other things and expose those ideas to the idea management system. To have a mechanism in place to control those ideas for implementation, it's very important to be part of this, which is as box manager" (Moderator, Idea box 12)</i></p> <p><i>"I was interested in seeing how we can improve things. And I think that was my main driver". (Moderator, Idea Box 1)</i></p>
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### 1.3. Cross-Case Analysis

(Below we report an example of a table we developed for cross-case analysis. The table summarizes the different practices developed by moderators to manage their idea boxes. Moreover, it provides some insights on which activities at the front-end of innovation these moderators focus on).

Idea Box	Organizing the search for ideas		Stimulating Ideas		Evaluating and Selecting Ideas		Developing and Championing Ideas		Performance
	Structured/ Unstructured	Open/Closed	Monetary and non-monetary incentives	Performance targets	Process	Feedback	Discuss and develop ideas	Sell ideas to management	
1	Unstructured approach. However, moderators are currently developing more focused areas.	Open to all the organization	Five levels of monetary awards for accepted ideas. Points-based system. Certificate with virtual medals.	Four types of KPIs: (1) How many people contribute with ideas and comments; (2) how many are accepted; (3) how many are implemented; (4) time for processing ideas. KPIs are also established at the departmental-level.	Box managers and innovation drivers (board)	Target to provide feedback to every idea within 30 days.	Help the submitter develop the business case. Help in finding the implementation owner to take the idea further.	They present ideas to a committee of line managers.	High
2	Organized around focused areas	Closed, limited to the unit	Point-based system, recognition and rewards	One idea submitted and one implemented per year	Innovation board of box managers	Through the box for every idea	Help develop the idea and prepare the business case	Help during implementation, attract resources	High
3	Organized around focused areas	Closed, limited to the unit	Point-based system	-	Innovation board (box managers)	Informally	Seek clarifications before selection	-	Medium
4	Organized around focused areas	Closed, limited to the unit	Focus on visibility and recognition, rather than monetary rewards.	-	Innovation board (box managers)	Informally	Provide support, seek clarifications	Limited help	Medium
5	Organized around focused areas	Closed, limited to the unit	Informally	-	Informally (conversations)	Informally	Personal discussions to help improve an idea and prepare presentation	-	Low
6	Organized around	Closed,	Informally	At the beginning	Informal meetings	Informally	Help developing,	-	Low

	focused areas	limited to the unit		(number of ideas), but they removed them.			informal meetings		
7	Organized around focused areas	Closed, limited to the unit	None, but they are planning to introduce a point-based system	-	-	-	Provide some help, mainly informally	-	Low
8	Organized around focused areas	Closed, limited to the unit	-	-	Informal	-	The submitter is regarded responsible for this task	The submitter is regarded responsible for this task	Low
9	Organized around focused areas	Closed, limited to the unit	-	-	-	Limited	-	-	Low
10	Unstructured approach	Closed, limited to the local office	Some recognition	KPIs were removed	Box managers	Limited (not enough resources)	Some help, but limited number of box managers	-	Closed
11	Organized around focused areas	Open to all the organization	-	-	Box managers	Through the box and face-to-face	Experimentation week. Technical steering group to help progress the idea in the next stage.	-	Medium
12	Organized around focused areas	Open to all the organization	Point-based reward system based on submitted and implemented ideas. Recognition.	Number of submitted ideas and approved ideas.	Preliminary screening by box managers, ideas are then assigned to selected experts.	Done by the experts. Make sure that very idea receives feedback.	Discuss the idea and seek clarifications.	Help attract resources	High
13	Organized around focused areas	Open to all the organization	Rewards and recognition will be introduced next year	1) Get an idea implemented locally; 2) Ideas approved from global site. The plan is to remove them.	Reviewing committee of box managers	Through the box and email	Help prepare the business case for presentation and find a sponsor	Help attract resources	High

<b>14</b>	Organized around focused areas	Open to all the organization	Rewards and recognition	1) Number of ideas at the individual and team-level. 2) How much value it is realized.	Box managers and innovation coaches	Through the box and informally	Help prepare the business case. Help prepare a feasibility study.	Help find the sponsor and attract resources	High
<b>15</b>	Problem-driven	Open to all the organization	Focus on visibility and recognition, rather than monetary rewards.	-	Box managers	Through email, box and face-to-face	Experimentation week + round of funding. Help/guide to develop the idea	Through the experimentation week	High
<b>16</b>	Organized around focused areas	Open to all the organization	Some rewards and recognition	-	Board of box managers	Through the box	Seek clarifications, help develop through the back-office	Some help in attracting resources	Low
<b>17</b>	Organized around focused areas	Open to all the organization	Point-based system and virtual medals	-	First screening by box managers after which ideas are assigned to selected managers		Provide support if needed	Limited help	Low
<b>18</b>	Organized around focused areas	Closed, limited to the region	Virtual medals (recognition) and rewards	Both at the regional and departmental level	Box managers	Through the box	Not involved, more seeking clarifications. Check the material before presentations.	Help find sponsors to implement ideas. Facilitate presentation of ideas at an innovation council.	Medium
<b>19</b>	Organized around focused areas	Closed, limited to the region	Monetary rewards and recognition	At the regional level	Box managers	Through the box	Not involved, more seeking clarifications. Focus on improving this aspect.	Help find sponsors to implement ideas. Presentation of ideas at an innovation council	Medium
<b>20</b>	Organized around focused areas	Open to all the organization	-	KPIs have been removed.	-	-	-	-	Low



## Essay 3

# Why Do Ideas Get Selected? Idea Selection in an Online Ideation Platform<sup>5</sup>

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### ABSTRACT

Whereas recent research focuses on how to generate variation by expanding the sets of ideas available to organizations, little attention is placed on understanding what happens after an idea is generated. In this paper I contribute to the innovation management literature by studying the maturation process occurring in an online ideation platform, where contributors engage in discussing and improving submitted ideas, and how this affects their selection. I explore how different types of knowledge diversity of contributors mature ideas better for selection. Moreover, I argue that idea selection also depends on the characteristics of the idea, both in terms of its type (process vs. product) and its formulation. Based on a rich and extensive dataset of 726 ideas and 2925 comments submitted on an online ideation platform of a large Danish firm over the course of 16 months, I employ a probit model to explore the effect of these factors on the likelihood of an idea being selected. I find evidence to support my claim that both the characteristics of the idea and the diversity brought by contributors to the initial maturation process affect the success chances of an idea. Implications for both innovation management research and practitioners are discussed.

**Keywords:** *innovation; idea management; idea selection; knowledge diversity; idea characteristics*

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<sup>5</sup> This essay is a revised version of a paper presented at the Academy of Management conference 2015 and at the DRUID winter conference 2015. Also, this essay has received the ‘*Best paper nomination*’ at the Academy of Management Conference 2015 and the ‘*Nominee for the Steven Klepper Award for Best Young Scholar Paper 2015*’ at the DRUID summer conference 2015. Previous versions of this essay were also presented at the SEI consortium at Bocconi University and at the Centre for Integrative Innovation Management at SDU. I am grateful for all the valuable feedback I received during these presentations. The essay is in the process of being submitted to a major journal.

## 1. Introduction

Recently an increasing number of firms has implemented web-enabled ideation systems to collect and handle ideas generated from the internal crowd of employees (van den Ende et al. 2014). These systems differ from traditional suggestion schemes due to their increasingly interactive and open character, thus enabling more collaborative approaches to innovation by engaging the diverse crowd of distributed employees. In fact, employees are empowered not only with the possibility to generate new ideas, but also to virtually interact and collaborate among each other to further build and mature them (Deichmann and van den Ende 2014). Arguably, the interactive and open character of these systems becomes relevant for the initial maturation of newly submitted ideas, as employees can leverage each other's experiences, knowledge domains and expertise to move them further for implementation (Deichmann and van den Ende 2014). This suggests that not only submitters but also contributors to ideas – i.e. employees who provide inputs directed at further improving them – may play a crucial role in the idea maturation process (Simon and Tellier 2011; Deichmann and van den Ende 2014; Tortoriello et al. 2015). Consequently, these informal networks of interactions emerging around submitted ideas - often labeled as idea networks - may influence their subsequent usefulness and performance by contributing to improve them. These networks enable employees to share their knowledge and expertise as well as to provide help and support to the submitter, in this way “favoring access and exposure to novel insights” (Baer 2010, p. 593).

However, while current studies mainly focus on how to generate variation by expanding the pool of ideas available to organizations (Piezunka and Dahlander 2014; van den Ende et al. 2014), little attention is placed on understanding what happens after an idea is generated. In particular, little is known about the initial maturation process occurring after an idea is submitted on an online ideation platform – where contributors engage in discussing and

improving it – and how this affects its selection. This study addresses this research gap by examining the factors affecting organizations’ decision to select a given idea (or not) for funding<sup>6</sup>. More precisely, current innovation literature has not fully addressed the effect of two key factors on idea selection: (1) the heterogeneity of contributors to ideas; and (2) the characteristics of the ideas. By considering these factors, this study attempts to combine two main streams in the innovation management literature: one depicting innovation as a social and collaborative process and the other focusing on the characteristics and nature of the innovation itself. In this study I posit that both aspects may affect idea selection.

First, this study examines the different types of knowledge diversity that contributors bring to an idea. Whereas prior innovation studies focus on the effect of structural elements of idea networks on ideation performance (Bjork and Magnusson 2009; Bjork et al. 2011), the characteristics of the contributors participating to them - an aspect which is often labeled as ‘content’ of an idea network - have not been fully addressed. Content relates to the diverse sources of expertise, experiences and knowledge domains that contributors share and transfer to the ideation process (Kijkuit and ven den Ende 2010; Tortoriello et al. 2015). As idea networks may not necessarily attract diverse contributors in terms of their characteristics (Baer 2010), it becomes important to directly study how different types of contributors’ knowledge diversity may mature ideas better for selection. In order to do so, I distinguish between contributors’ diversity and idea network size – a typical structural element of idea networks – to examine their effect on idea selection. Especially in the context of web-enabled ideation systems, it can be argued that contributors’ diversity may play a crucial role in the maturation process due to the possibility of creating virtual discussions around ideas spanning various boundaries within an organization. Such diversity may then constitute an important lever for generating valuable inputs to improve initiated ideas as well as reflect interest from

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<sup>6</sup> In the context of this study, selection means that a decision to invest both financial and human resources into an idea is made by a review panel to take it further for implementation.

diverse ‘others’ within the organization. This becomes especially important considering that the maturation of ideas is often a collaborative process (Perry-Smith and Shalley 2003; Burt 2004; Perry-Smith 2006). Nevertheless, the effect of such heterogeneity on idea selection is overlooked by current research. Building on arguments related to the opportunity to discuss ideas with large and diverse crowds of contributors, I hereby examine the effect of contributors’ diversity on idea selection by considering contributors’ individual characteristics (e.g. functional assignments, geographical locations and status). Second, I posit that organizations’ decision to select an idea may also be influenced by its characteristics (Goldenberg et al. 2001). It can be argued that the way an idea is framed and formulated by the submitter as well as its type may influence whether organizations provide attention and support to it (Dutton and Ashford 1993; Goldenberg et al. 2001; Howell and Boies 2004). However, little attention is placed by current research on exploring aspects related to idea formulation and content. Hence, the question I address is: *“How do the heterogeneity of contributors to an idea and the characteristics of the idea itself affect an organization’s decision to select it for funding?”*.

Based on a rich and extensive dataset of 726 ideas and 2925 comments submitted on an online ideation platform of a large Danish firm over the course of 16 months, I employ a probit model to explore the effect of these factors on the likelihood of an idea being selected. This dataset includes detailed information about the status of submitted ideas (i.e. whether they have been selected or rejected) and related employees’ discussions prior to their evaluation. In addition, I obtained employee-level information through the organization’s human resources data in relation to both idea submitters and contributors.

This study contributes to the innovation management literature in three distinct ways. First, a key contribution lies in theorizing about the initial maturation process occurring in online

ideation platforms after an idea is generated, where other employees engage in discussing and improving it. This study shows that the virtual discussions emerging around submitted ideas indeed contribute to increase their success chances by further improving them. Hence, I shed more light on a key phase of innovation - idea maturation and selection – which often has been neglected by current research, especially with regards to online settings. Second, the findings of this study show the key contribution of two distinct mechanisms to idea selection. One mechanism relates to the benefits of attracting a large number of contributors to an idea (up to a certain optimal level), the other highlights the importance of engaging diverse contributors for maturing and refining ideas. In particular, my findings show that the diversity brought by contributors to an idea in terms of functional knowledge domains and expertise increases its success chances, while other characteristics such as geographical locations and status do not bring additional benefits to idea selection. As such, this indicates that what matters for idea selection is the knowledge content that contributors add to an idea. Third, this study shows that certain characteristics related to the way an idea is formulated as well as its type (process vs. product) also have a significant impact on idea selection. However, these characteristics and their effect on idea success have not been investigated by current research. From a management perspective, this study highlights the importance for managers of engaging distributed employees not only in the generation of ideas, but also in helping to improve others' ideas to move them further for implementation. Thus, web-enabled technologies can contribute to the building of social capital by linking the crowd of distributed employees to diverse competences, expertise and knowledge domains.

## **2. Theory and Hypotheses**

### **2.1. Social Networks and Idea Maturation**

Current innovation literature stresses the benefits for organizations of employing web-enabled ideation systems to expand the diversity of inputs to be accessed (Frese et al. 1999;

van den Ende et al. 2014). Most studies, however, do not address the subsequent selection process and, more precisely, which factors affect the selection of ideas (Reitzig and Sorenson 2013). This phase of innovation is crucial as managers can only select a limited number of ideas to which assign resources for their further development (Reitzig and Sorenson 2013). It is claimed that, when studying idea selection, it is important to consider factors happening prior to selection that could have an impact on the subsequent outcome (Csikszentmihalyi 1996). Relatedly, it can be argued that the diverse inputs provided by distributed contributors after an idea is generated may help mature it better for selection, by favoring the sharing of diverse expertise, perspectives and competences. The initial maturation process occurring in an online ideation platform can then play a key role for selection especially considering that initial ideas constitute “raw materials” (Audia and Goncalo 2007, p. 1). Thus, they need to be further elaborated and developed in order for the organization to be able to evaluate them and make a decision (Kijkuit and van den Ende 2010). As stated by Bayus (2013, p. 227), “because they are voluntarily offered, ideas from the crowd often show a low degree of elaboration and thus can sometimes be vague and immature”. Similarly, when initially submitted, employees’ ideas may not provide enough details to the organization about their content, their potential implementation benefits and related costs, thus making their evaluation more difficult (Piezunka and Dahlander 2014). Hence, discussions with diverse contributors may enable to increase the quality of an idea and make it more solid (Kijkuit and van den Ende 2010). This may then enhance its success chances (Hargadon 2002).

Several studies highlight the role of social networks in favoring access to novel information (Burt 2004; Perry-Smith 2006; Bjork and Magnusson 2009). A key issue with many studies, however, is that they tend to relate certain structural characteristics of idea networks, such as size or brokerage, to the diversity of knowledge and resources that is exchanged or transferred by contributors (Tortoriello et al. 2015). As a consequence, they do not consider

which types of knowledge diversity contributors bring into the ideation process and how they may be beneficial for the maturation and selection of ideas. As Rodan and Galunic (2004, p. 545) emphasize, “Network structure has been used as a proxy for information and knowledge heterogeneity, although the latter is never directly measured”. Hence, exploring the content of idea networks in terms of contributors’ characteristics becomes central (Rodan and Galunic 2004; Baer 2010; Piezunka and Dahlander 2014). Building on these arguments, I distinguish between the number of contributors participating to an idea - a dimension which is commonly labelled as idea network size - and contributors’ characteristics to analyze their effects, independently and jointly, on idea selection. Arguably, by doing so it is possible to examine whether and to what extent contributors’ diversity matters for the maturation and selection of ideas. Finally, I discuss the role of idea characteristics as an additional key factor affecting idea selection. My hypotheses are summarized in Figure 1.

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

## **2.2. Idea Network Size**

Before moving an idea into investment in the traditional innovation funnel, discussions among a large number of contributors and their engagement with the idea are likely to play a key maturing and legitimizing role (Simon and Tellier 2011). Employees can contribute with their views and perspectives to an idea, discuss improvements as well as provide feedback about its potential or feasibility (Deichmann and van den Ende 2014). A large number of contributors can thus help further mature an initiated idea by providing “their unique frames of reference” (Van de Ven 1986, p. 593). Similarly, Von Hippel (1986, p. 202) highlights that the quality of an idea increases over time through subsequent contributions: “Each succeeding statement clearly provides a valuable increment of data useful for defining a new product need and devising a responsive solution”. As such, idea network size may enable to

access more diverse perspectives and knowledge domains (Baer 2010; Kijkuit and Van den Ende 2010; Bjork et al. 2011). At the same time, it may also constitute a key mechanism to signal contributors' support and thus credibility for an idea (Simon and Tellier 2011). In fact, it may signal whether an idea is considered relevant by a large crowd of contributors, thus attracting organization's attention (Piezunka and Dahlander 2014). Thus, I hypothesize the following:

*H1: The greater the number of contributors participating to an idea, the higher the likelihood that it is selected for further investment and investigation.*

### **2.3. The Role of Contributors' Characteristics**

Several studies emphasize that interactions between diverse individuals have a positive effect on ideation efforts (Perry-Smith and Shalley 2003; Bjork et al. 2011). In fact, such interactions may enable to explore various alternatives and perspectives which can be beneficial to refine ideas and take them forward for implementation (Perry-Smith 2006). However, despite these studies highlight the benefits of attracting diverse contributors into the ideation process, little understanding remains about which types of knowledge diversity are more beneficial for the maturation and selection of ideas. In this respect, I suggest that the diversity of perspectives, knowledge domains, expertise and experiences that contributors add to submitted ideas may play a crucial role for their selection by providing additional value to them. More specifically, in this study I examine the effect of three types of contributors' characteristics: functional assignments, geographical locations and formal ranking in the hierarchical structure.

As stated by Baer (2010, p. 594), "access to fundamentally different pockets of information should be maximized when networks connect individuals to colleagues working in different parts of an organization". As such, diversity in terms of functional assignments may be beneficial for refining ideas due to the different perspectives and views that are exchanged by

contributors (Perry-Smith 2006). This is especially important considering that a functional assignment is often associated with the specialized knowledge and expertise that an employee has in a specific domain (Bunderson and Sutcliffe 2002; Kijkuit and Van den Ende 2010). Another source of diversity relates to the geographic locations of employees, who can virtually collaborate and interact across different parts of an organization to mature and implement ideas. Differences in geographical locations may then be beneficial because of employees' exposure to diverse environments, which may enable them to share valuable work-related knowledge with employees from other locations (Cummings 2004). Overall, it can be argued that contributors coming from different functions and parts of an organization may be able to provide more diverse perspectives and expertise to an idea (Baer 2010). Therefore, a higher diversity of contributors' characteristics may be beneficial to mature an initiated idea better for selection. Thus, I hypothesize:

*H2a: The greater the diversity of contributors participating to an idea (in terms of functional assignments and geographical locations) the higher the likelihood that it is selected for further investment and investigation.*

In addition, employees working in different hierarchical positions may possess different types of knowledge and experiences (Menon and Blount 2003). An employee's hierarchical position may then constitute a signal of his or her status within the organization – and potentially his or her ability (Menon and Blount 2003). A higher status is, in fact, often associated with an employee's unique expertise (Menon and Blount 2003) as well as it may constitute a source of power and authority (Ibarra 1993). If employees participating to an idea occupy a higher hierarchical position - being for instance an executive vice president or a director - their contributions may be considered more relevant by other employees (Reitzig and Sorenson 2013). This is because status may bias how ideas are evaluated (Menon and Blount 2003; Reitzig and Sorenson 2013). As a consequence, during the selection process the contributions provided by high-status employees may be evaluated more positively compared

to similar information from random others (Menon and Blount 2003; Reitzig and Sorenson 2013). Moreover, due to their position, high-status contributors may be aware of potential opportunities residing within the organization which may be beneficial for submitters (Kijkuit and Van den Ende 2010). Thus, the participation of high-status contributors (i.e. with a higher formal rank) may have an important influence on idea selection. Hence, I hypothesize:

*H2b: The greater the number of high-status contributors participating to an idea, the higher the likelihood that it is selected for further investment and investigation.*

#### **2.4. The Complementary Effect of Size and Diversity**

As pointed out by Baer (2010) and Tortoriello et al. (2015), the fact that many studies do not distinguish between structural properties of idea networks and their diversity leads to a lack of clarity about which mechanisms actually contribute to ideation performance. In a similar manner, I posit that it is important to understand the relationship between idea network size and contributors' diversity in the context of idea selection. This is to shed more light on whether idea selection is driven by the number of contributors participating to an idea and/or, by a higher level of diversity in their characteristics (Baer 2010). Several studies claim that idea network size positively affects ideation performance, as a larger size enables to expand the sources of knowledge and expertise that are exchanged (Bjork et al. 2011; Deichmann and van den Ende 2014). However, a larger size may not necessarily entail the participation of more diverse contributors (Baer 2010). For instance, an idea may attract a large number of participants to further mature it, but these may have similar functional background or may work in the same location. An idea developed by such individuals may then end up being narrow-minded and therefore have a lower quality. In this case, a larger network size may not yield the same benefits to idea maturation and selection. Hence, a better understanding is needed about the relationship between idea network size and contributors' characteristics. However, this relationship and its effect on idea selection are not tested by current literature. Building on previous network studies, I suggest that there may be a positive interaction effect

between the size of an idea network and contributors' characteristics. If an idea attracts a larger number of contributors coming from different functions, locations or hierarchical levels, this would enable them to share more diverse perspectives (Baer 2010) and thus may be beneficial to further improve an idea. A larger and more diverse crowd of contributors may then "increase the breadth of information available" (Baer 2010, p. 593), hence having positive effects on idea selection. On the contrary, it may be that the benefits of a larger size diminish when contributors are less diverse in their characteristics. Thus, I hypothesize:

*H3: Idea network size and diversity jointly and positively affect the likelihood of an idea being selected for further investment and investigation.*

## **2.5. The Role of Idea Characteristics**

Several innovation studies highlight the importance of examining how the characteristics of an idea influence its success chances (Goldenberg et al. 2001; Gatignon et al. 2002). Taking into account these characteristics is important considering that organizations can assign resources only to a limited number of ideas for their further development (Kock et al. 2014). As a consequence, "the relative value of an idea becomes crucial for selection" (Baumann and Stieglitz 2014, p. 361). For instance, it is claimed that idea-level characteristics such as the simplicity of an idea, whether it provides immediate returns or whether it links to current organizational practices may influence organizations' selection decision (Blair and Mumford 2007). Relatedly, I posit that certain characteristics of an idea are likely to influence an organization's decision to select it (or not) for further investment. In this study I consider the influence of three main idea characteristics on idea selection: (1) the length of the idea description; (2) the positive and negative sentiments expressed in the idea description; and (3) the type of idea.

Arguably, the way ideas are formulated and framed by the submitter may trigger a different response from the organization, potentially affecting their subsequent selection. For instance,

Afuah and Tucci (2012) posit that the chances of solving an innovation-related problem also depend on its formulation and, more specifically, on its “ease of delineation and transmission” (Afuah and Tucci 2012, p. 361). Similarly, if the description of an idea is too short and provides only limited information, an organization may negatively evaluate it (Reitzig and Sorenson 2013; Piezunka and Dahlander 2014). This may occur because it becomes more difficult for the organization to understand the idea (Piezunka and Dahlander 2014) and, at the same time, it may indicate that the submitter did not invest time in its elaboration (Haas and Hansen 2005). On the other hand, a too long idea description may be considered “time-consuming to digest” (Piezunka and Dahlander 2014, p. 866). Taken together, these arguments suggest that there is a curvilinear relationship between the length of an idea description and its likelihood of being selected, such that a longer description has a positive effect on idea selection but only up to a point, after which it starts to have negative effects. Hence, I propose:

*H4a: There is an inverted U-shaped relationship between the length of an idea description and the likelihood of an idea being selected for further investment and investigation.*

Moreover, it is claimed that individuals can link the framing of an idea to specific aspects considered important by the organization as a way to gain attention and support (Howell and Shea 2001). For instance, the issue selling literature claims that ‘issue packaging’- the way an issue is formulated and framed by an individual - affects organizations’ decisions to allocate attention and support to it (Dutton et al. 2001). Previous studies highlight that individuals can use different frames in their selling attempt – for instance, threat versus opportunity or urgent versus non-urgent – and that these frames play a key role in gaining organizations’ support (Dutton and Ashford 1993). Similarly, the content of an idea description may be framed in different ways by the submitter. For instance, Reitzig and Sorenson (2013) highlight that ideas can be framed with a more positive or negative tone. In the case of a positive framing

the submitter emphasizes the potential benefits of an idea, while in a negative framing specific organizational-related problems or issues become highly stressed (Reitzig and Sorenson 2013). However, while diffused in other fields, only a limited number of studies have started to investigate the effect of positive and negative framings in the context of innovation (Reitzig and Sorenson 2013; Piezunka and Dahlander 2014). Building on previous issue selling studies, I argue that if the submitter focuses on discussing a specific problem or issue when framing the content of an idea - thus formulating it with a more negative tone - it may be perceived as a relevant matter by the organization, thereby increasing its likelihood of being considered (Dutton and Ashford 1993; Dutton et al. 2001). Hence, I propose that:

*H4b: The likelihood of an idea being selected for further investment and investigation increases when the idea is expressed with a more negative tone.*

Finally, the type or category of an idea may also have an effect on organization's decision to select it (or not). While it is claimed that distinguishing between types of ideas may lead to richer insights on the ideation process (Bjork and Magnusson 2009), little attention is placed on this aspect. For instance, previous studies on suggestion schemes highlight that organizations tend to implement ideas suggested by employees that help improve work-related production processes or the work context for employees (Carrier 1998; Frese et al. 1999). The main reason is that these ideas are more aligned with the overall continuous improvement strategy behind the use of the scheme (Carrier 1998). However, current studies mainly focus on the use of online ideation platforms to generate product innovation while disregarding other kinds of innovation that may be considered relevant by the organization. In particular, a key distinction relates to product and process-related ideas. While product-related ideas are associated with the introduction of new products and services or the improvement of existing ones, process-related ideas aim at improving existing internal-related organizational processes, production processes or working activities (Mumford 2011). A key question is then which type of ideas is more likely to be selected by organizations for

further investment. It may be argued that ideas with a more internal process-related focus may be favored by organizations in the selection process. The main reason behind this argument is that these ideas often permeate the entire organization and have a cross-functional nature (Mumford 2011; Davenport 2013). As such, it becomes more difficult to identify and manage them (Davenport 2013). Considering that “large firms’ structures do not reflect their cross-functional processes” (Davenport 2013, p. 12), I suggest that the use of online ideation platforms may facilitate the collection and processing of these opportunities for internal process innovation across the whole organization which otherwise would lack a structure to flow into. Hence, I hypothesize:

*H4c: The likelihood of an idea being selected for further investment and investigation increases when the idea is process-related rather than product-related.*

### **3. Methods and Data**

#### **3.1. Research Setting**

This study was conducted in a global organization headquartered in Denmark, ‘Delta’, operating in the manufacturing industry. Delta employs more than 13,000 employees and manufactures and sells thousands of play products in more than 130 countries. The organization implemented several open innovation initiatives over the last years and created various online platforms to involve their external users in collaboration and co-creation activities. However, Delta has recently decided to define a new open innovation strategy, where a central focus was placed on creating an online ideation platform that enables its users, both internally and externally, to generate and develop new ideas. The first step of this strategy consisted in implementing the ideation platform internally to foster a culture of collaboration and sharing across the whole organization. In particular, the system was launched in December 2012 and was designed to favor not only the generation of unsolicited ideas and solutions to specific organizational challenges, but also to foster virtual

collaboration and interactions among employees. While financial rewards are not provided, the organization focuses on providing recognition to employees for their efforts. Also, employees have the possibility to earn virtual points and badges, depending on their level of activity on the platform as well as on the quality of their submissions. Because of the open and interactive character of the system, employees can submit ideas as well as comment on ideas generated by others. As such, this allows the organization to benefit from employees' proactive initiatives (Deichmann and van den Ende 2014), while simultaneously allowing them to interact and build on each other's ideas. In particular, informal conversations held with the innovation managers responsible for the system highlighted that both the content of the idea and the comments provided by contributors are taken into consideration during the selection process and thus play an important role.

Hence, this setting constitutes a relevant context to examine idea selection for two reasons. First, Delta provides employees with the autonomy to generate new ideas. At the same time, their ideas get discussed and matured with the contribution of other employees before they get selected. Second, the data collected from the ideation platform provide important information about the selection process and, most importantly, enable to distinguish between those ideas that were selected for further investment and investigation and those that were rejected.

### **3.2. Data**

To test the proposed hypotheses, I combined data from several sources. First, I extracted all information from the platform since its launch in December 2012 until April 2014. This sample consists of 800 ideas submitted by employees over this time frame. However, these data were cleaned in several ways. First, I removed some ideas which were introduced by the innovation managers during the launch to test the functioning of the system and, as such,

were not relevant for the analysis. Second, I removed ideas which were not written in English. This was necessary in order to understand the content of the ideas and analyze their positive and negative sentiments. Third, I removed ideas that were still in progress, especially those belonging to current challenges launched by the organization, and thus for which it was not possible to have information about their status. Such cleaning procedure resulted in an overall sample consisting of 726 ideas initiated by 361 employees. Each idea contains information about the title, a description of its content as well as a list of keywords selected by the submitter to classify it. The aim of these keywords is to better understand the domain field of the idea and thus facilitate the subsequent evaluation process. The second data source is the range of comments made by employees on the platform for each idea. These comments and related contributors' information were used to create the measures of idea network size and contributors' diversity. In total, there were 2925 comments on ideas prior to selection. As a third data source, I obtained employee-level information from Delta's human resources department. These data relate to employees' geographical location, functional assignment and job title. Finally, these sets of data were augmented by more qualitative information. I participated in various meetings at the headquarter office and held several informal interviews with the innovation managers in charge of running the ideation platform. These qualitative data enabled me to better understand the context, the functioning of the system, people involved as well as how ideas are handled in the organization.

### **3.3. Measures**

#### ***Dependent Variable***

The dependent variable is a dichotomous variable, *selected for funding*, with a value of one indicating that the idea was selected for further investment and investigation and a value of zero indicating that the idea was rejected. The way this dependent variable is operationalized follows other innovation studies which have used a similar measure for the selection of ideas,

such as Reitzig and Sorenson (2013), Deichmann and Van den Ende (2014), and Kijkuit and Van den Ende (2010). The success rate is not very high as only 76 ideas have been selected out of 726 ideas. In relation to the evaluation and selection process, the innovation managers in charge of the system organize regular meetings on a monthly basis with a panel of experts across the organization to evaluate all submitted ideas. These experts are key managers coming from different functions and departments selected for their competences and expertise in their own area: *“We have regular check-in meetings with other experts across our organization, e.g. we meet with a team of engineers on a monthly basis to look through ideas about Engineering/Technology/Production...The same goes for ideas about Sustainability – then we meet with the department working within this field”* (Innovation Manager). As indicated by this quote, the organization tries to achieve the optimal selection process by flexibly changing the experts within the panel depending on the types of ideas to be evaluated. This is to ensure that ideas get evaluated by the right experts on a continuous basis. Moreover, having a diverse and flexible panel of experts may contribute to reduce individual biases during the evaluation process (Blindenbach-Driessen et al. 2010; Reitzig and Sorenson 2013). After evaluating the feasibility of the idea and its alignment with the current strategy, a decision is made regarding whether to continue further working on an idea - and thus invest resources in it - or whether to reject it. This phase of the selection process is considered important, meaning that after the selection decision human and financial resources are allocated to further develop selected ideas. These ideas are then transformed into more formal innovation projects and are transferred to a specific department for further development. Table A1 in the appendix reports a sample of selected ideas posted on the platform.

### ***Independent Variables***

**Idea network size.** I operationalized the size of the idea network simply as the number of employees who contributed to an idea initiated by the submitter. This measure can indicate both support from contributors and the range of knowledge and perspectives that are brought into to the discussion (Kijkuit and Van den Ende 2010; Deichmann and van den Ende 2014).

**Contributors' characteristics.** Blau's (1977) index was used to compute the measures of diversity and, in particular, the measures of functional assignments and geographic locations:

$$B = 1 - \sum_i^k p_i^2$$

where  $p_i$  is the proportion of contacts in the  $i$ th category. The data used for the measures of diversity came from human resources records: 1) Geographic locations relate to the country code where employees currently work; 2) Functional assignments refer to an employee's knowledge domain and area of expertise. It was defined as the function assigned to each employee, namely: R&D, marketing and sales, engineering, innovation, manufacturing/production, business administration, design, project management, information technology, administrative support, human resources, finance, and distribution/warehouse. These measures of diversity were computed for each idea network by using E-NET (Borgatti 2006), based on the characteristics of all the contributors who participated to an initiated idea; 3) For employees' formal rank, I obtained human resources data from the organization on hierarchical levels. There are five hierarchical levels in the company. As such, I coded employees' job titles according to these hierarchical levels: lower management positions were coded as 1 whereas corporate management reached 5. Based on these hierarchical levels, I then calculated the proportion of contributors with a high status (i.e. high formal rank) contributing to the maturation of each idea<sup>7</sup>.

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<sup>7</sup> As a robustness test, I derived an alternative measure for status based on the Blau's index. This was done in order to measure not only the effect of high-status contributors on idea selection, but also the effect of contributors' diversity in terms of status. I retested H2 and H3 with contributors' status diversity instead of

**Idea's length.** To capture the length of the idea description, I calculated the number of words in the description of each idea. To test whether there are diminishing returns to the likelihood of an idea being selected, I included its squared effect (Piezunka and Dahlander 2014).

**Positive and negative sentiments.** To calculate the tone of each idea, I performed a sentiment analysis based on the package Python NLTK 2.0.4 Text Classification. This package enables to measure the extent to which a specific text expresses positive sentiments, negative sentiments or whether it is neutral by using hierarchical classification (Bird et al. 2009). The sentiment is calculated based on a list of positive and negative words developed by Pang and Lee (2005). For each idea in the database, I then reported the respective positive and negative polarities (or neutrality), expressed in terms of classification probabilities.

**Type of idea.** By reading through all the idea descriptions, I divided the submitted ideas into distinct categories. From this preliminary analysis, I developed a coding scheme with two main categories: (1) internal process-related ideas and (2) product/market-related ideas. Process-related ideas refer to ideas directed at improving internal organizational processes, production processes as well as working processes. Product-related ideas, on the other hand, involve improvements to existing products, services and markets or the introduction of new ones (Mumford 2011). Such distinction follows a similar logic developed by Ibarra (1993) who distinguishes between: 'administrative ideas' and 'technological ideas'. I discussed the coding scheme with another researcher who also read through all the idea descriptions and assigned them to the two identified categories. The checks for inter-coder reliability suggested that the coders were consistent at separating ideas among the two categories. We achieved 94% agreement and a Cohen's kappa of 0.848, which is considered a good score of inter-coder reliability (Cohen 1960). A total of 565 product-related ideas and 161 process-related ideas were identified.

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proportion of high-status contributors. Results are consistent with the ones shown in this study: contributors' status does not bring additional benefits to idea selection.

### ***Control Variables***

I also included several variables to control for alternative explanations that could affect idea selection both at the idea-level and at the submitter-level.

#### ***Idea-level Controls***

***Part of a challenge.*** I included a dummy to control for whether an idea is part of a company organized innovation challenge or not. It can be expected that the likelihood of an idea being selected for further investment and investigation may decrease when the idea is submitted to a challenge. The main logic behind this is that the launch of a challenge stimulates the submission of a large number of ideas. After the closure of the challenge, evaluators may then select only one or a few ‘winning’ ideas which may contribute to solve the challenge among the several submitted ideas.

***Time since inception.*** Following Deichmann and van den Ende (2014), I included a time variable which specifies the month of an idea submission. It may be argued that employees may submit more ideas at the beginning due to the novelty of the system and to the possibility to share ideas with the rest of the organization. However, while the launch of an ideation system may initially stimulate the generation of many ideas, their quality may vary (Deichmann and van den Ende 2014).

***Momentum of an idea.*** I included a variable measuring the length (in terms of days) of the idea maturation process, starting from when the idea was submitted until the last comment provided to it (Deichmann and van den Ende 2014). The intuition is that ideas that gain momentum faster and thus attract participants to contribute in a shorter period of time may trigger organizational attention and thus increase their likelihood of selection.

***Contributors’ endorsement.*** It may be argued that idea selection may depend not only on the individual characteristics of contributors, but also on the supporting nature of their comments as these may signal to organizations whether ideas are supported or not (Piezunka and

Dahlander 2014). In order to control for this, I included a variable that measures the level of positive and negative endorsement provided by contributors to an idea. In this respect, three coders independently coded the comments provided by contributors to ideas prior to their selection with the purpose of distinguishing between those comments indicating positive endorsement and those indicating negative endorsement. While the first coder coded all the comments, a large number of comments was randomly distributed to the other two coders (1000 comments to the second coder and 500 comments to the third coder). Non-supportive comments were categorized as those comments highlighting the limitations of an idea, its lack of feasibility or relevance as well as problems with its implementation, while supporting comments were those highlighting its benefits or potentialities. The three coders reached a level of agreement of 86% and a Cohen's kappa of 0.7 for such categorization, which is considered a decent score. Similarly to what suggested by Salter et al. (2013), after the coding procedure I counted the number of words in each coded comment to develop the measure of positive/negative endorsement for each idea. Considering that participation to the platform is voluntary, this measure may indicate the extent to which employees put efforts in discussing benefits or problematics related to a submitted idea<sup>8</sup>.

### ***Submitter-level Controls***

***Status, gender and location.*** According to Ibarra (1993), an employee's power and authority in the organization may come from individual characteristics, such as education and experience, and structural characteristics, such as subunit membership and formal rank. Arguably, these characteristics may bias evaluators during the selection process (Menon and Blount 2003; Reitzig and Sorenson 2013). As such, I included as control variables: submitter's hierarchical position in the organization (status), gender and location. Accordingly, a measure of status is developed based on the hierarchical levels of the

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<sup>8</sup> As a supplementary analysis, I created an alternative measure of contributors' endorsement as the proportion of positive/negative comments provided to an idea. Including this simpler variable provides the same results – i.e. contributors' endorsement does not affect idea selection.

organization. In addition, I controlled for whether the submitter works at the headquarter office (HQ), as this may provide him/her with better knowledge about potential organizational opportunities or requirements (Salter et al. 2013).

***Prior experience in generating ideas.*** I controlled for whether the submitter has previously generated ideas on the platform (Bayus 2013). This is because a more productive idea generation process – in terms of quantity of submitted ideas – may have an influence on idea selection (Simonton 2003; Bayus 2013). Previous experiences in ideation may, in fact, increase the likelihood for submitters to accumulate learning and thus generate better ideas over time (Deichmann and van den Ende 2014). I thus calculated the cumulative number of ideas generated by each submitter before the submission of the focal idea (Bayus 2013).

***Points achieved.*** I included as a control the number of virtual points earned by each submitter for the activities performed in the system. This score is determined by the organization depending on the level of activity of the submitter in the system, in terms of usage of the system, commenting activities as well as submission of new ideas. These points reflect the participation of each individual and thus can be used as a proxy for the level of activity in the system. I included this measure because it may be argued that more active submitters in the system may become more familiar and gain more experience with it, which may affect the likelihood of having their ideas selected.

***Past success.*** In a recent study, Bayus (2013) posits that submitters' past success in idea implementation may negatively affect their subsequent ideation efforts, especially due to cognitive fixation effects which may reduce the quality of subsequent ideas. Relatedly, it can be argued that past success in idea selection may also have an effect on subsequent ideas initiated by the same submitter. I thus control for past success by measuring the cumulative number of selected ideas submitted by an employee prior to the submission of the focal idea (Bayus 2013).

### **3.4. Estimation Technique**

Given the dichotomous nature of the dependent variable, I used a probit model to examine the effects of independent and control variables on the likelihood of an idea being selected. Considering that several ideas are generated by the same submitter, I controlled for the non-independence of the observations by calculating robust standard errors clustered by the idea submitter (Audia and Goncalo 2007; Salter et al. 2013). Also, considering that the coefficients estimated through a probit model cannot be directly interpreted (Long and Freese 2006), I employed the techniques suggested by Long and Freese (2006) and King et al. (2010) to interpret the findings and the interaction effects.

In addition, as this study investigates the factors affecting the selection of ideas, the sample I use for testing my hypotheses is represented by participants to the system – i.e. subscribers to the system who have submitted ideas, comments to ideas or both. This, however, may result in a nonrandom sample which may bias my findings, as passive subscribers (i.e. those individuals who did not participate in any idea through comments or did not submit any idea) are not included in this study. Thus, including only idea submitters and contributors may raise the issue of selection bias, as it does not consider what determined employees' participation to the platform in the first place. I then calculated the inverse Mills ratio to control for this selection bias (Heckman 1979), by using available data about the subscribers taken from the ideation system. More precisely, I used subscribers' geographic location, ranking of the job titles, functional assignments and number of log-ins into the system. The number of times an employee logged into the system was correlated with the probability of submitting an idea and/or a comment, while it did not have any significant effect on idea selection. I then

included the inverse Mills ratio into the probit model<sup>9</sup> (more details are reported in the Appendix).

#### **4. Results**

Table 1 presents descriptive statistics and correlations between the variables. Following the suggestions of Neter et al. (1990), I standardized idea network size and the measures of contributors' diversity before estimating their interaction effects. I also calculated the variance-inflated factors to determine whether multicollinearity could be an issue. The highest VIF score was 5.56. Considering that a threshold level of 10 is generally considered acceptable (Greene 1997), this excludes the issue of multicollinearity. Table 2 presents the results from the probit model predicting the likelihood of an idea being selected. The first model is the baseline model, including only the control variables. Models 2-3 add the variable for idea network size (number of contributors) and its squared term, while models 4-9 introduce each measure of contributors' diversity as well as the interaction effects with idea network size. Model 10 introduces the variables for the characteristics of an idea. Finally, model 11 reports the full model.

----- Insert Table 1 and 2 here -----

#### **Hypothesis 1**

Estimates of model 2 indicate the idea network size has a positive and significant effect on idea selection ( $p < 0,01$ ). Thus, I found support for hypothesis 1 which predicted that attracting a larger number of contributors to an idea increases its likelihood of being selected for further investigation. Following the suggestions of Long and Freese (2006), in Table 3 I reported the changes in predicted probabilities to further interpret the findings (based on the coefficients from Model 11). As explained by Deichmann and van den Ende (2014), when using this technique it is possible to calculate "changes in predicted probability as the independent

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<sup>9</sup> Including the inverse Mills ratio does not change the results.

variable changes from: (1) its minimum to its maximum, (2) one-half unit below base value to one-half unit above, and (3) one-half of the standard deviation below base to one-half of the standard deviation above” (Deichmann and van den Ende 2014, p. 681). For instance, it is possible to observe that the probability of an idea being selected increases by 5% in case of one-half unit change of idea network size. The effect of idea network size on idea selection can also be observed in Figure 2 (coefficients are taken from Model 11; all other variables are set to their mean value). The figure shows that a change in idea network size from its minimum to its maximum increases substantially the likelihood of an idea being selected. Moreover, the graph shows that the number of contributors has a diminishing effect on idea selection. As a supplementary analysis, I included the squared term of idea network size to determine whether there was a curvilinear relationship with idea selection. This turned out to be negative and significant (Table 2, Model 3:  $p < 0,01$ ). The inflection point for idea network size corresponds to 29 contributors (which is within the observed range), after which it seems to have decreasing returns. In other words, this finding indicates that attracting a large number of contributors to an idea seems to be beneficial for idea selection, but only up to an optimal level.

--- Insert Table 3 and Figure 2 here ---

### **Hypotheses 2 and 3**

Models 4-9 introduce the effect of each measure of contributors’ characteristics on idea selection, separately as well as and together with idea network size. These estimates indicate that having contributors to an idea spanning diverse functional boundaries has a positive and significant effect on idea selection (Model 4;  $p < 0,05$ ). In particular, Table 3 shows that a change in functional diversity from its minimum to its maximum increases the likelihood of an idea being selected by 14%. On the other hand, estimates from Model 6 and 8 indicate that both diversity in geographical locations and the proportion of high-status contributors are not

significant and thus appear neither to enhance nor to diminish the success chances of an idea. As such, I found support for hypothesis 2, which predicted a positive relationship between contributors' characteristics and idea selection, only in relation to functional diversity. This finding seems to indicate that only diversity in terms of knowledge domains and expertise contributes to mature ideas better for selection, while geographical locations and high-status do not affect idea selection.

Moreover, I tested the interaction effect between each measure of contributors' characteristics and idea network size (Hypothesis 3). Estimates from Model 5 show that the interaction effect between number of contributors and functional diversity is positive but not significant. This indicates that functional diversity and number of contributors have an independent effect on idea selection (Model 5,  $p < 0,01$  for both idea network size and functional diversity). In models 7 and 9 the interaction effect between contributors' characteristics and the number of contributors is significant and positive for geographical locations (model 7;  $p < 0,01$ ) and significant and negative for high-status (model 9;  $p < 0,1$ ). In order to further interpret these results, I conducted post-hoc analyses (Salter et al. 2013; Haas et al. 2014). This is because interaction effects in non-linear models cannot be directly interpreted (Ai and Norton 2003; Salter et al. 2013; Haas et al. 2014). However, it is possible to interpret them through the simulation-based procedure proposed by King et al. (2000) and recently used in some innovation studies (Salter et al. 2013; Criscuolo et al. 2014; Haas et al. 2014). Based on this procedure, the interaction effects can be represented graphically, thus making the interpretation easier (Criscuolo et al. 2014). Following the suggestions of Criscuolo et al. (2014), I used this procedure to derive the predicted probabilities of idea selection at three levels of country diversity and high-status (the moderating variables) over the entire range of idea network size (the moderated variable), while holding all the other explanatory variables at their mean values (Zelner 2009; Salter et al. 2013; Criscuolo et al. 2014). The predicted

probabilities are shown in Figures 3a-3b, using values at the 10<sup>th</sup> percentile, mean and 90<sup>th</sup> percentile (estimates from model 11 are used).

----- Insert Figures 3a-3b here -----

In line with hypothesis 3, figure 3a shows that there is a joint and positive effect between idea network size and diversity in geographical locations on idea selection. In particular, as the number of contributors increases, the likelihood of an idea being selected is higher for higher levels of country diversity compared to lower levels. This finding suggests that additional benefits to idea selection arise from attracting a large number of contributors working in diverse geographical locations. On the other hand, figure 3b reveals that there is a substitution effect between number of contributors participating to an idea and high-status. Thus, contrary to my expectations, this finding indicates that having a greater number of contributors with a high hierarchical status diminishes the effect of idea network size on idea selection, compared to having contributors with a lower status.

#### **Hypothesis 4**

Model 10 shows that both the type of idea and the length of the idea description have a positive and significant effect on idea selection (Model 10;  $p < 0,001$  for idea type;  $p < 0,05$  for idea length). On the other hand, the effect of positive and negative sentiments is not significant. Thus, I found support for hypotheses 4a and 4c, but not for hypothesis 4b. In relation to the length of the idea description, the significance of the squared term indicates that there are decreasing returns on the probability of an idea being selected. This confirms my hypothesis that ideas with an intermediate length are more likely to be selected. Figure 4 shows the inflection point after which a longer idea description seems to have a negative effect on idea selection (holding all the other variables constant at their mean values).

---- Insert Figure 4 here ----

In relation to the type of idea, the estimates provide support for hypothesis 4c, which predicted that organizations will tend to select internal process-related ideas rather than product-related ideas. Table 3 shows that the likelihood of an idea being selected increases by 7% when the idea is process-related. This finding is also supported by some informal interviews held with one of the innovation managers in charge of the system, who reported that process-related ideas are easier to track and process compared to product-related ideas, thus having a higher chance of being selected. Contrary to my expectations, I did not find a significant effect between the sentiments expressed in an idea and its likelihood of being selected. One possible reason is that the ideas in my dataset were mostly expressed with a positive tone, thus making the analysis of positive and negative sentiments less significant in this context.

Finally, a further investigation of the control variables also shows some interesting findings. For instance, submitter's prior experience in generating ideas appears to have a negative and significant coefficient. Contrary to previous studies (Bayus 2013), this finding indicates that generating more ideas is not necessarily beneficial for the submitter. One explanation for such finding may be that "submitters think that they should exploit their knowledge in a similarly functional domain again" (Deichmann and van den Ende 2014, p. 678), which may lead them to generate very similar ideas. Moreover, the estimates show that being part of a challenge tends to diminish the likelihood of an idea being selected. Yet, interestingly, I found that submitter's status, the number of accumulated points, submitter's past success in generating selected ideas and the level of supportive/non-supportive comments provided to an idea do not have a significant effect on idea selection.

## **5. Discussion**

### **5.1. Theoretical Contributions**

This study aimed at shedding more light on the factors affecting idea selection. I found that both the heterogeneity of contributors participating to an idea and the characteristics of the idea itself affect organization's decision to select it for funding. These findings have broad implications for innovation management scholars and social network theory. First, this study extends current research by shedding more light on the initial maturation process occurring in online ideation platforms after an idea is generated, where other contributors engage in further discussing it. While several studies highlight the importance of social capital for ideation, little attention has been placed on understanding the maturation process occurring in such online settings. My findings indicate that this process is important to further refine submitted ideas before their selection and that contributors' diversity plays a key role in it. Besides, these findings have key implications for innovation research considering that current studies tend to focus on the characteristics of idea submitters, while disregarding the role of contributors for ideation and their characteristics (Bayus 2013; Deichmann and van den Ende 2014). Second, by distinguishing idea network size from content, I show how different types of contributors' knowledge diversity can help mature ideas better for selection. The variety of knowledge domains, experiences and expertise which contributors bring is indeed crucial for the maturation and selection of ideas in online ideation platforms. The results of this study highlight the importance for scholars to consider diversity with respect to contributors' knowledge domains and expertise (i.e. functional assignments) as a critical factor that is independent of the effect of idea network size. This does not negate, however, the value of idea network size. In fact, my findings are consistent with those of prior research in showing that idea network size – i.e. the number of contributors participating to an idea - plays an important role in idea selection (Kijkuit and Van den Ende 2010; Bjork et al. 2011). It thus constitutes an important mechanism to gain credibility and legitimacy for an idea (Simon and Tellier 2011) as well as add value to an idea by bringing diverse perspectives (Deichmann

and van den Ende 2014). However, I also demonstrate that there are diminishing returns to idea selection, meaning that increasing the number of contributors is beneficial up to some optimal level after which the effect on idea selection decreases. This finding is in line with some current innovation studies showing that idea networks with an optimal size have a positive effect on innovation (McFadyen and Cannella 2004; Baer 2010). Hence, for the selection of ideas, attracting a large number of contributors provides an advantage independent of functional diversity and this main effect remains in the interaction models. This indicates that both mechanisms can contribute to idea selection. A large number of contributors (up to a certain optimum level) may increase the likelihood of an idea being selected even when there is no functional diversity, while functional diversity may have a positive effect even with a limited number of contributors. This highlights the importance of distinguishing between the size of an idea network and contributors' diversity to better understand their effect on idea selection.

Furthermore, this study indicates that other types of contributors' characteristics - particularly in terms of geographical locations and status - are not sufficient on their own to mature an idea better for selection. This hints to the conclusion that not all sources of diversity in ideation contribute to enhance the success chances of an idea. One possible explanation for this finding is that, differently from functional assignments, these sources of diversity do not necessarily bring expertise and sharing of diverse knowledge domains to the maturation process. However, while these findings indicate that diversity in terms of geographical locations does not provide an advantage on its own, it seems to constitute a useful complement to idea network size. Thus, additional benefits to idea selection may arise from attracting a large number of contributors dispersed across different geographical boundaries rather than within the same boundaries. In such case, exposure to diverse environments becomes beneficial for idea selection. On the other hand, I found that attracting many

contributors with a high status in the organization diminishes the effect of idea network size on idea selection. Although different studies highlight that higher-status employees are more influential compared to lower-status ones and may lead to biases in the evaluation process (Saunders et al. 1994; Menon and Blount 2003; Reitzig and Sorenson 2013), my findings seem to suggest that these characteristics do not affect idea selection. One possible explanation for this finding may be that “the effect of status on performance depends on the particular organizational or environmental context” (Ahuja et al. 2003, p. 24). In this case, it may well be explained by the flat hierarchical structure characterizing the Scandinavian organization included in this study. This particular context suggests that the selection of ideas is not affected by the number of high-status contributors participating to the maturation process. Moreover, a possible explanation for why I observe a negative interaction effect between idea network size and high-status contributors could be attributed to the fact that such employees do not necessarily provide more valuable or relevant inputs to an idea compared to lower status contributors. This may be true when it comes to online ideation platforms, especially considering that employees’ voluntarily participation requires time and efforts going beyond daily work-related tasks (Constant et al. 1996; Deichmann and van den Ende 2014). It may also be argued that high-status contributors may use these platforms to signal whether they endorse an idea (or not), while lower status contributors may be better at providing valuable inputs as they are ‘closer’ to what the idea is about. However, such argumentation would require further investigations in order to be sustained. Interestingly, another possible explanation may be related to the way this ideation platform was designed by the organization. Employees’ characteristics such as job title or location are not directly visible to participants to a submitted idea. As such, the status of contributors is not something that is highly signaled on the platform, requiring participants to enter the personal profile of contributors to obtain more information. This may also explain why status does not play a

significant role for idea selection. Overall, these findings seem to indicate that it is indeed the knowledge content brought by contributors that play a key role for the maturation and selection of ideas rather than other characteristics such as status or location.

Finally, this study extends the innovation management literature by showing that the characteristics of an idea also play a crucial role for idea selection. While current studies place limited attention on how ideas are formulated and framed by the individual submitter, my findings suggest that these aspects matter for organizations' selection decision. In fact, I found that the length of an idea description - and hence its degree of elaboration - has diminishing returns to idea selection. This may be explained by the fact that a very long idea description can create a 'cognitive load' for the evaluator (Haas et al. 2014), who would then consider the evaluation process of an idea more costly. As pointed out by Haas et al. (2014), this cognitive load may be caused by different reasons. While these authors examine this issue in the case of problem formulation, a similar reasoning may be applied to idea formulation. For instance, it may be that longer idea descriptions are less likely to be selected because they lack focus on the key aspects of an idea or because of their complexity which would then require evaluators "to utilize more complex cognitive schemas to process them" (Haas et al. 2014, p. 685). As a consequence, it may become more difficult for the evaluator to understand and evaluate the idea (Haas et al. 2014). At the same time, this study indicates the importance of distinguishing between different types of ideas when it comes to ideation. Exploring such distinction is particularly salient considering that the type of innovation may have consequences on its success (Gatignon et al. 2002). Relatedly, this study shows that process-related ideas are more likely to be selected for further investment compared to product-related ideas. One possible reason is that process-related ideas tend to be executed more rapidly than product-related ideas, thus requiring fewer resources for their implementation. Building on this, my finding may also suggest that organizations tend to use

these online ideation platforms for internal process innovation. As such, they may respond to their strategic need to facilitate the implementation of those ideas which in many cases become difficult to access or track due to their cross-departmental nature or due to the lack of a formal structure for them to flow into (differently from product or market-related ideas) (Davenport 2013). Besides, it may be also argued that employees may be able to provide relevant process-related ideas due to their specialized organizational-related knowledge (Henderson and McAdam 2001). They may then be knowledgeable about inefficiencies residing in the organization (Unsworth and Parker 2003), hence increasing the likelihood of these ideas to be selected.

Overall, this study contributes to the innovation management literature and social network theory by highlighting how the content channeled through idea networks has implications for the outcomes we predict. The importance of considering network content has been emphasized in a recent study by Piezunka and Dahlander (2014). By distinguishing content from structure, these scholars show that different types of distance have important effects on the attention provided by organizations to individuals' suggestions. Thus, after studying network structures and ego networks it is essential to include content into the analysis, as the resources that are transferred by each contributor to an idea network are different (Baer 2010). However, network studies often disregard the key role of content (Piezunka and Dahlander 2014). This study contributes to this discussion by showing the importance of considering the resources that are mobilized around submitted ideas in terms of contributors' heterogeneity and their implications for the maturation and selection of ideas.

## **5.2. Managerial Implications**

This study provides key implications for practice. My findings show the importance for organizations to foster collaborative approaches during the ideation process allowing

contributors to develop relationships that span various boundaries, especially of a cross-functional nature. While research stresses the importance of attracting a large crowd of contributors when it comes to ideation, I suggest that managers also need to consider the types of interactions that they want to promote to ensure access to diverse knowledge and expertise. This finding has key implications for organizations because it shows the value of web-enabled ideation platforms not only in collecting ideas, but also in further maturing them before they are transferred into the traditional innovation funnel. This hints to the importance of attracting the right type of contributors and tap into their collective knowledge in this initial maturation process. Finally, I suggest that managers should consider aspects related to the way an idea is formulated and framed, as these aspects may have consequences on its selection. For instance, my findings about the length of an idea description may be used by managers to improve the guidelines for idea submission, making sure that the submitter provides enough details about an idea for it to be understandable avoiding at the same time too long and redundant descriptions. Furthermore, while this study shows that online ideation platforms may constitute a tool to more easily detect and progress internal process-related ideas, it is important that relevant product/market-related ideas do not become disregarded in the selection process due to their longer processing times.

## **6. Limitations and Future Research**

This study also has important limitations that need to be taken into account. The first limitation relates to the extent of generalizability of these findings, as the data I collected for this study are based on one organization. The organization included in this study constitutes a particular setting, especially considering the strong emphasis on fostering collaborative behaviors among distributed employees through the use of the online ideation platform. This may also explain why contributors' diversity is important in this context. It could be interesting for future research to examine whether similar findings in relation to idea

selection occur in other settings. The second limitation relates to the maturity of the idea management system. Because this system is relatively recent, it still represents a ‘learning-on-the-way’ process for the organization. In fact, ambiguities about the selection process still remain and the organization is currently in the process of improving the evaluation mechanisms, both in terms of the actors in charge of the evaluation as well as criteria to follow. A third limitation arises from not having access to individual-level information about the experts in charge of the selection process. An interesting question could be whether selection biases may be present due to the characteristics of such experts, in line with what Reitzig and Sorenson (2013) have started to investigate. Relatedly, a fourth limitation relates to the lack of data about the subsequent implementation of ideas. As such, it is not clear whether selected ideas are actually implemented by the organization or whether a subset is disregarded after the subsequent development process. Similarly to what pointed out by Salter et al. (2013), this is important considering the consequences it may have on the allocation of organizations’ implementation resources. However, it is still a key issue for researchers to obtain detailed data on these important phases of the innovation process within organizations (Salter et al. 2013). Future research could further investigate which factors affect not only the selection of ideas but also their actual implementation, by focusing on the different stages of their development process. A fifth limitation arises from the use of a cross-sectional design which did not allow me to further examine the dynamics of ideation networks. However, the use of a cross-sectional design was important to generate detailed explanations about which factors affect idea selection at different levels of the analysis – i.e. at the idea-level, contributor-level and submitter-level. Future research could further examine idea networks and selection of ideas with a longitudinal design to shed more light on their dynamics. Finally, it is important to acknowledge that some interactions and discussions about employees’ ideas may occur in offline and more informal settings. Although I am not

able to analyze such interactions, this study still shows the importance of exploring the initial maturation process occurring in online settings and the characteristics of contributors participating to it.

## **7. Conclusion**

This study contributes to current innovation literature by shedding more light on idea selection in online ideation platforms. Based on data collected from an online ideation platform of a large Danish firm, this study provides key insights into the factors affecting idea selection at different levels.

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**Table 1. Descriptive Statistics and Correlation Matrix**

Variables	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1. Selected	0,10	0,31	0	1																					
2. Status of the submitter	1,93	0,65	1	5	0.04																				
3. Submitter's country (HQ)	0,43	0,50	0	1	0.09*	0.22*																			
4. Submitter's gender	0,25	0,43	0	1	-0.01	-0.18*	-0.01																		
5. Prior experience in generating ideas	0,70	0,85	0	3,49	-0.05	-0.11*	-0.23*	0.02																	
6. Number of points	48,99	53,50	2,6	235,9	0.01	-0.06	-0.13*	0.01	0.72*																
7. Past success	0,177	0,448	0	2	-0.02	-0.02	-0.01	0.05	0.64*	0.51*															
8. Part of a challenge	0,32	0,46	0	1	-0.05	0.15*	0.11*	0.01	-0.12*	-0.07*	-0.07*														
9. Time since inception	5,70	4,30	1	12	0.00	-0.02	-0.04	0.04	-0.02	0.03	0.02	0.10*													
10. Momentum of an idea	43,94	75,06	1	447	0.23*	0.04	0.02	-0.02	0.04	0.14*	0.025	-0.09*	-0.04												
11. Supportive comments (lenght)	115,2	151,4	0	1509	0.33*	0.09*	0.03	-0.03	-0.05	0.10*	0.00	0.00	-0.09*	0.27*											
12. Non-supportive comments (lenght)	19,1	50,12	0	377	0.01	0.11*	0.06	-0.05	-0.02	0.02	0.02	0.04	-0.02	0.15*	0.14*										
13. Idea network size	4,00	3,59	1	43	0.42*	0.09*	-0.00	-0.02	0.05	0.13*	0.02	0.05	0.01	0.28*	0.68*	0.16*									
14. High-status contributors	0,07	0,15	0	1	0.01	0.46*	0.16*	-0.06	-0.09*	-0.07	-0.05	0.04	0.03	-0.02	0.03	0.04	0.03								
15. Functional assignments	0,47	0,28	0	0,87	0.23*	0.06	0.18*	0.01	-0.03	0.07*	-0.05	0.01	-0.05	0.31*	0.41*	0.21*	0.49*	0.07							
16. Geographical locations	0,38	0,27	0	0,81	0.06	0.02	-0.11*	-0.03	0.06	0.10*	-0.03	-0.04	-0.11*	0.19*	0.32*	0.16*	0.34*	-0.05	0.59*						
17. Idea's length	80,55	55,04	3	365	0.02	0.10*	0.05	-0.14*	-0.01	-0.001	0.02	-0.11*	-0.17*	0.10*	0.16*	0.11*	0.02	0.04	0.06	0.08*					
18. Type of idea	0,22	0,41	0	1	0.17*	-0.03	0.06	0.11*	-0.01	0.007	0.05	-0.12*	-0.04	0.15*	0.01	0.02	-0.03	-0.005	0.05	-0.10*	-0.01				
19. Positive sentiments	0,36	0,29	0	0,9	-0.03	0.03	-0.03	-0.01	0.08*	0.089*	0.04	-0.04	-0.07*	-0.01	0.01	0.01	-0.03	-0.001	0.001	0.04	0.08*	0.05			
20. Negative sentiments	0,29	0,25	0	0,8	0.01	-0.02	0.04	-0.06	-0.02	0.018	-0.03	-0.03	-0.05	-0.003	0.004	0.08*	-0.03	-0.03	0.01	0.05	0.03	0.06	0.54*		

Correlations with \* are significant at 5%. Number of observations: 726

**Table 2. Selection of Ideas: Probit Model (N=726)**

	1	2	3	4	5	6	7	8	9	10	11
<b>Control variables</b>											
<b>Submitter-level</b>											
Submitter status	0.03 (0.113)	0.03 (0.122)	0.04 (0.123)	0.053 (0.124)	0.05 (0.123)	0.032 (0.120)	0.041 (0.122)	0.048 (0.139)	0.056 (0.152)	0.107 (0.144)	0.147 (0.157)
Submitter gender	-0.01 (0.157)	-0.02 (0.158)	-0.03 (0.17)	-0.052 (0.159)	-0.065 (0.161)	-0.018 (0.156)	-0.004 (0.164)	-0.020 (0.158)	-0.043 (0.161)	-0.101 (0.162)	-0.117 (0.178)
Submitter location HQ	0.361 (0.149)**	0.443 (0.154)***	0.464 (0.169)***	0.369 (0.162)**	0.348 (0.160)**	0.414 (0.152)***	0.456 (0.157)***	0.447 (0.156)***	0.501 (0.164)***	0.231 (0.169)	0.247 (0.184)
Prior experience in generating ideas	-0.292 (0.134)**	-0.291 (0.136)**	-0.285 (0.145)**	-0.304 (0.137)**	-0.304 (0.137)**	-0.287 (0.136)**	-0.292 (0.141)**	-0.288 (0.137)**	-0.289 (0.141)**	-0.293 (0.151)*	-0.306 (0.162)*
Points achieved	-0.0002 (0.001)	-0.0007 (0.001)	-0.001 (0.002)	-0.0009 (0.001)	-0.0008 (0.001)	-0.0006 (0.001)	-0.001 (0.002)	-0.0007 (0.001)	-0.001 (0.002)	-0.0004 (0.002)	-0.001 (0.002)
Past success	0.05 (0.185)	0.05 (0.197)	0.058 (0.218)	0.102 (0.195)	0.113 (0.192)	0.047 (0.198)	0.025 (0.212)	0.05 (0.197)	0.057 (0.204)	0.058 (0.219)	0.027 (0.243)
<b>Idea-level</b>											
Part of a challenge	-0.268 (0.155)*	-0.417 (0.175)**	-0.51 (0.175)***	-0.449 (0.168)***	-0.437 (0.165)***	-0.412 (0.172)**	-0.469 (0.176)***	-0.42 (0.173)**	-0.437 (0.170)**	-0.348 (0.168)**	-0.429 (0.170)**
Momentum of an idea	0.002 (0.0006)***	0.002 (0.0007)***	0.001 (0.0007)***	0.002 (0.0006)***	0.002 (0.0006)***	0.002 (0.0007)***	0.002 (0.0007)***	0.002 (0.0007)***	0.002 (0.0007)***	0.001 (0.0007)*	0.001 (0.0008)
Time since inception	0.006 (0.016)	-0.010 (0.016)	-0.006 (0.016)	-0.010 (0.016)	-0.011 (0.016)	-0.011 (0.016)	-0.01 (0.017)	-0.01 (0.016)	-0.01 (0.016)	-0.003 (0.017)	0.00002 (0.017)
Non-supportive comments	-0.001 (0.001)	-0.002 (0.001)	-0.002 (0.001)*	-0.002 (0.001)*	-0.002 (0.001)*	-0.002 (0.001)	-0.001 (0.001)	-0.002 (0.001)	-0.001 (0.001)	-0.002 (0.001)	-0.001 (0.001)
Supportive comments	0.002 (0.0005)***	-0.00003 (0.006)	-0.0003 (0.0005)	-0.00009 (0.0005)	-0.0001 (0.0005)	-0.00002 (0.006)	-0.002 (0.0007)	-0.00002 (0.0005)	0.0002 (0.0005)	-0.0001 (0.0006)	-0.0001 (0.001)
<b>Independent variables</b>											
H1: Idea network size <sup>†</sup>		0.502 (0.154)***	0.894 (0.14)***	0.437 (0.154)***	0.343 (0.139)***	0.514 (0.172)***	0.543 (0.101)***	0.503 (0.154)***	0.540 (0.127)***	0.487 (0.164)***	0.495 (0.141)***
Idea network size squared <sup>†</sup> (supplementary analysis)			-0.064 (0.017)***								
H2a: Functional assignments <sup>†</sup>				0.261 (0.125)**	0.306 (0.095)***					0.34 (0.128)***	0.457 (0.131)***
H2a: Geographic locations <sup>†</sup>						-0.064 (0.104)	-0.074 (0.083)			-0.145 (0.105)	-0.237 (0.094)**

H2b: High-status contributors <sup>t</sup>								-0.031 (0.088)	-0.095 (0.097)	-0.092 (0.104)	-0.128 (0.099)
H3: Idea Network Size*Functional Assignments				0.103 (0.168)							0.040 (0.136)
H3: Idea Network Size*Geographic locations							0.242 (0.078)***				0.312 (0.08)***
H3: Idea Network Size *High- status contributors									-0.241 (0.137)*		-0.215 (0.108)**
H4a: Idea type										0.553 (0.165)***	0.615 (0.173)***
H4b: Idea length										0.009 (0.004)**	0.011 (0.004)**
H4b: Idea length squared										-0.00004 (0.00002)**	-0.00004 (0.00002)**
H4c: Positive sentiments										-0.317 (0.280)	-0.319 (0.307)
H4c: Negative sentiments										0.438 (0.326)	0.343 (0.353)
Inverse-Mills Ratio	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	-1.57 (0.29)***	-1.21 (0.322)***	-1.08 (0.336)***	-1.21 (0.329)***	-1.24 (0.324)***	-1.19 (0.321)***	-1.26 (0.323)***	-1.24 (0.351)***	-1.28 (0.376)***	-1.93 (0.386)***	-2.11 (0.412)***
Wald Chi Square	102.72***	80.72***	124.02***	96.42***	102.57***	89.90***	110.64***	80.41***	122.85***	118.23***	166.32***
Log likelihood	-197.63	-181.16	-171.95	-178.44	-178.13	-180.87	-176.42	-181.11	-178.36	-167.71	-158.26
Number of observations	726	726	726	726	726	726	726	726	726	726	726
Degrees of Freedom	12	13	14	14	15	14	15	14	15	21	24

Robust standard errors for two-tailed tests clustered by the idea submitter. \*p <0,10; \*\*p <0,05; \*\*\*p <0,01; t. Variable is standardized by subtracting the mean from the value and dividing by the standard deviation.

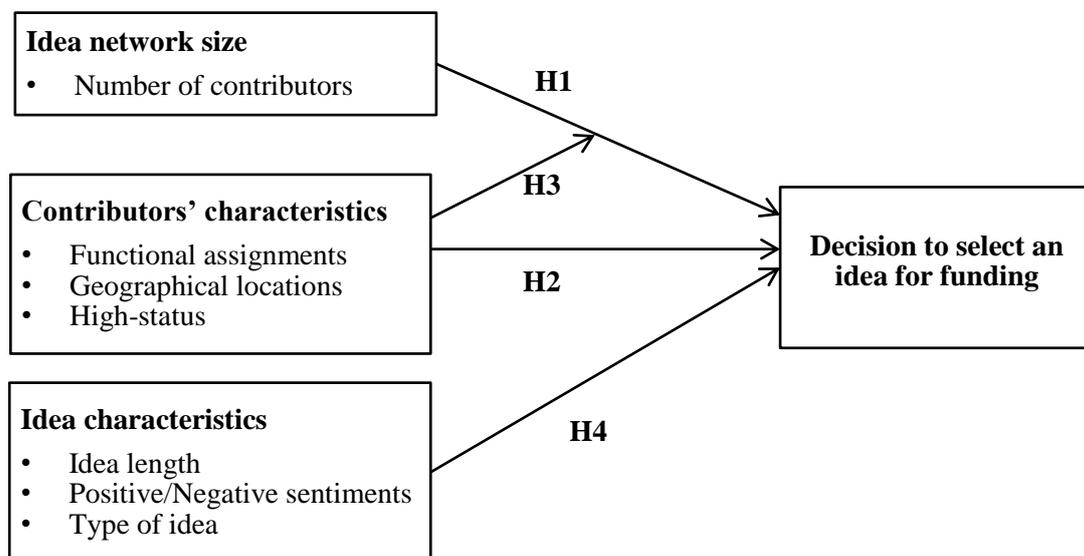
**Table 3. Changes in Predicted Probabilities of Idea Selection\***

Variables	min->max	0->1	+/1/2	-sd/2
Idea network size	0.9838	0.067	0.0454	0.0454
Functional assignments	0.1382	0.059	0.0417	0.0417
Geographical locations	-0.0643	-0.0173	-0.0214	-0.0214
High-status contributors	-0.0408	-0.0103	-0.0115	-0.0115
Idea network size * Functional assignments	0.0612	0.0037	0.0037	0.0034
Idea network size * Geographical locations	0.2469	0.0306	0.0282	0.0244
Idea network size * High-status contributors	-0.2550	-0.0163	-0.0194	-0.0143
Idea type	0.0747	0.0747	0.0569	0.0231
Idea length	0.9121	0.0001	0.0010	0.0556
Idea length squared	-0.1037	-0.0000	-0.0000	-0.0658
Positive sentiments	-0.0248	-0.0268	-0.0289	-0.0083
Negative sentiments	0.0264	0.0350	0.0311	0.0077

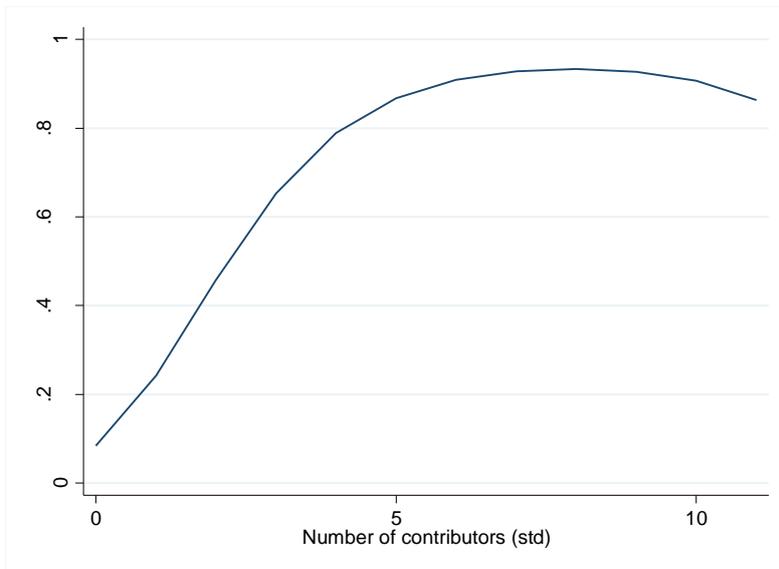
\* Changes in predicted probabilities are here reported only for the independent variables.

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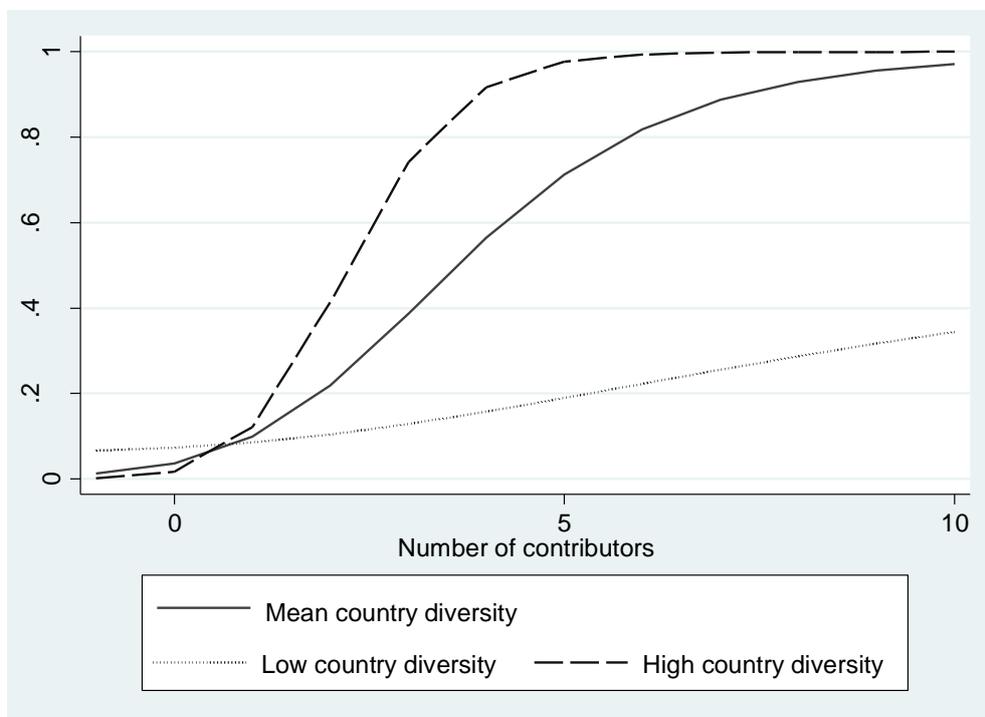
**Figure 1. Model of Idea Selection in an Online Ideation Platform**



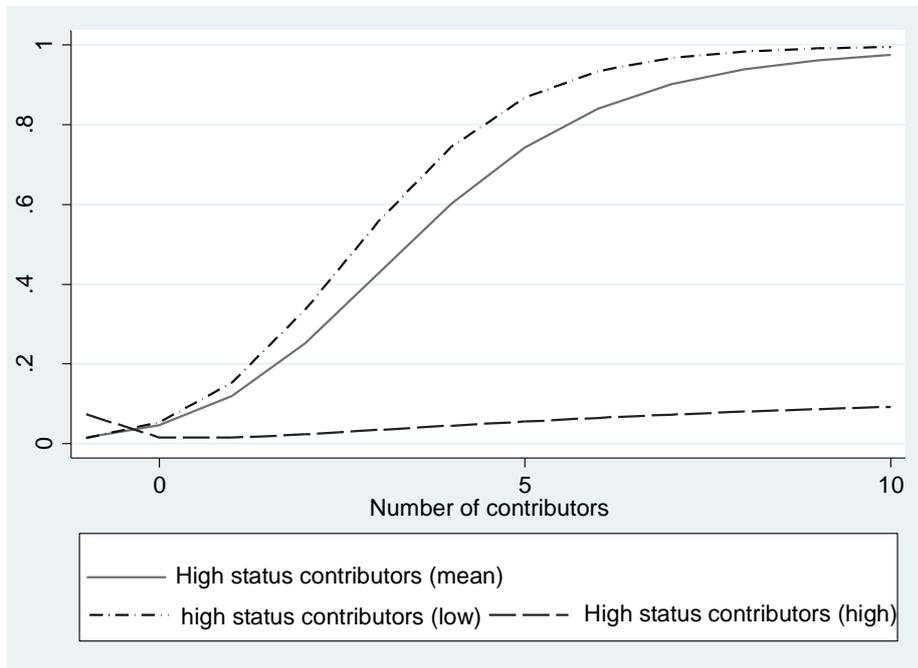
**Figure 2. Effect of Idea Network Size on Idea Selection**



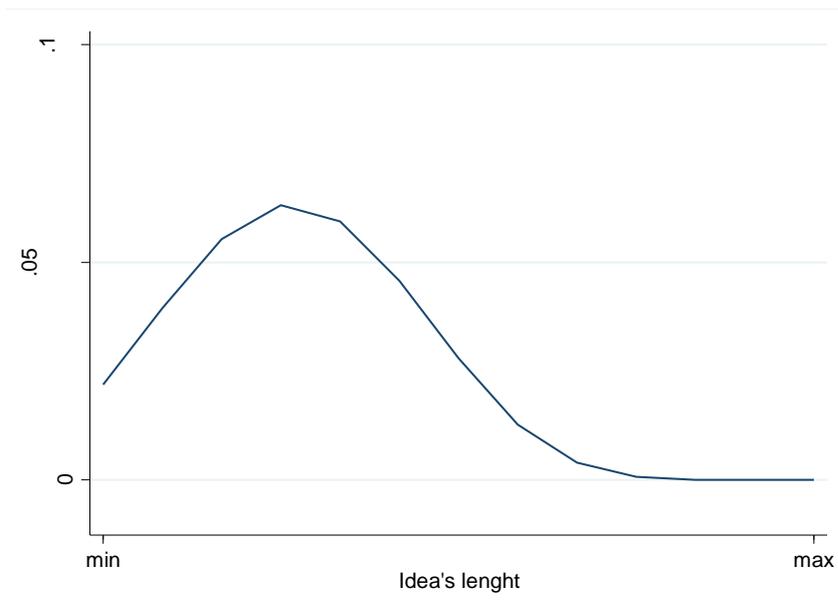
**Figure 3a. Predicted Changes in Probability of Idea Selection as the Number of Contributors Changes, By Three Levels of Country Diversity**



**Figure 3b. Predicted Changes in Probability of Idea Selection as the Number of Contributors Changes, By Three Levels of Status**



**Figure 4. Marginal Effect of Idea's Length on Idea Selection**



## Appendix

**Table A1. Sample of Selected Ideas Submitted on the Platform**

<p><b>Secure Packages</b></p>
<p>Consumer Services handles many contacts from disappointed customers who have purchased factory sealed packages that are missing all the xxx. These consumers have usually bought the set at a non xxx retail store. There is nothing worse than opening up your new xxx or xxx set and finding that the xxx are all gone! The current tape that we use to seal the boxes can easily be tampered with. My colleague did an experiment with a xxx set that he purchased. Her carefully removed the tape, emptied the box and placed the tape back on the box. The average consumer/retail associate would never have guessed that the tape had been removed. We could possibly prevent a consumer from purchasing these tampered with boxes by using tamper proof tape. This tape would have red lines on it that break upon removal. It would prevent our partners from allowing unopened sets to be returned and resold to our valued consumers.</p>
<p><b>Integrate Maintenance Management System with the Quality Information System</b></p>
<p>In production a lot of quality issues are related to machinery and the ones who know the most about the problem is the repairman. The repairmen are always requested to write a report about the issue and what they have done in the xxx system. In the same time, we also make registrations about quality issues in the xxx system, where the quality coordinators need to describe the problem again. If we would link the two systems together, we could have much more valuable information for solving problems and preventing future issues. Ideally the two systems should use the same set of error codes and when the operators make a job order for the maintenance, they should be able to automatically start a linked xxx registration in the same time.</p>
<p><b>Reduce waste by drinking tap water</b></p>
<p>An easy way for us to reduce waste in terms of empty water bottles, transportation etc. would be to minimize our consumption of bottled water. At least in HQ we have premium quality tap water so adding a few extra water coolers and then using tap water for meetings would save the environment for a lot of waste and provide a cheaper solution for 'Delta'.</p>

### Controlling for Selection Bias

As I have shared data about idea submitters/contributors and passive subscribers, I could compare the two groups. Table A2 shows the results from the t-test where the two groups were compared. Then, I used a probit model to predict the probability of submitting an idea and/or a comment to the system (Table A3). This table shows that the number of times employees logged-in to the system had a significant effect on the probability of submitting an idea and/or comment, but it did not affect idea selection. I then developed the inverse Mills ratio to control for selection bias that I integrated in the subsequent analysis. Including this ratio did not change the results in any way.

**Table A2. T-Tests Comparing Participants and Non-Participants**

<b>Variable</b>	<b>Participants (=732)</b>	<b>Non-participants (=3770)</b>	<b>t-test</b>
Geographic location	17,54	19,14	***
Functional assignment	7,87	7,72	
Status	1,98	1,91	*
Number of log-ins	19,56	4,1	***

p\* <0,1; p\*\* <0,05; p\*\*\* <0,01.

**Table A3. Probit Regression Predicting Participation**

<b>Variable</b>	<b>Model A</b>
Geographic location	-0.0126 (0.001)***
Functional assignment	0.0166 (0.006)
Status	0.139 (0.044)*
Number of log-ins	0.0799195 0.003***
Constant	-1.71136 (0.223)***
Log likelihood	-1421.544
Number of observations	3770
Number of selected observations	732

Notes. N=3770. Robust standard errors are in parentheses.

p\* <0,1; p\*\* <0,05; p\*\*\* <0,01.

## **Discussion and Conclusion**

In this thesis I have examined the role of IMS for innovation in large organizations with the aim of generating new insights into this important phenomenon. Below, I discuss the implications for theory and management practice of the findings of this thesis. Then, I return to answer the general research question. I conclude the thesis by briefly discussing its limitations and opportunities for future research.

### **1. Summary of the Findings and Theoretical Contributions**

All the three essays provide contributions to the innovation management research as well as to more specific research streams such as front-end of innovation and social network theory.

The first essay addresses the research question: *"How does the strategic thinking and emergence of an idea management system in large organizations impact on its development and implementation?"*. A key contribution of this essay is the identification of two alternative explanations for why and how IMS emerge: legitimacy-seeking and goal-orientation. This finding has key implications for current innovation literature because it shows the importance of considering alternative accounts when exploring the implementation and use of new technologies for innovation. As such, it may challenge more functionalistic explanations offered by current research. In fact, current studies are mainly concerned with the benefits and positive consequences of implementing IMS internally to generate innovation or they focus on explaining their outcomes (Frese et al. 1999; Bjork and Magnusson 2009; Dahlander and Piezunka 2014). However, my findings show that managers' need to generate innovation such as new products, services or processes constitutes a secondary motivation for why they decide to implement such systems. Instead, in many cases their decision was driven by the need to gain legitimacy both internally and externally, to respond to external competitive pressures or to drive an internal cultural change. Hence, this suggests that merely focusing on

the benefits of implementing IMS or their outcomes may lead to partial or incomplete conclusions about why and how IMS are employed in large organizations. Arguably, considering the increasing popularity and attention received by IMS, managers face the strategic imperative of continuously being innovative and of involving employees in innovation. However, this may also create some ambiguities in relation to the use of IMS. As such, it may lead some managers to engage in isomorphic actions and thus to employ IMS to respond to these pressures rather than for a real innovation need (Dimaggio and Powell 1983; Abrahamson and Rosenkopf 1993). Hence, these findings suggest the importance of reconsidering the traditional measures of success used to explain the outcome of IMS and of including alternative accounts. In fact, in many cases these systems were not designed with the intention of generating innovations. Second, the findings of this essay show how both internal and external drivers and managers' interpretative schemes may bias the way these systems are developed, leading to different patterns and outcomes. For instance, they influence whether and how managers think about important design dimensions of IMS such as their participation architecture, incentive mechanisms and evaluation mechanisms. At the same time, they influence the extent to which IMS become implemented within the organization. Hence, these findings may have broader implications for innovation management research and, more generally, for organizational research. In fact, they show the importance of incorporating insights from institutional theory and strategic management literature to better understand managers' motivations to employ new technologies for innovation and subsequent strategic choices and actions. As current innovation studies rarely explore managers' strategic thinking when it comes to innovation, they remain somewhat disconnected from such literatures. This is especially important in the light of the increasing diffusion of new technologies and tools for innovation such as crowdsourcing platforms, idea competitions or online communities (Piller and Walcher 2006; Faraj and Johnson 2011;

Bayus 2013). Finally, incorporating insights from such literatures may help explain why we observe important inter-firm differences in the implementation and performance levels of IMS for innovation.

The second essay addresses the research question: “*How is the ideation process moderated and managed in web-enabled ideation systems?*”. This essay contributes to the front-end of innovation literature by shedding more light on the role of an emerging set of actors - labeled as ‘moderators’ of ideation - in supporting the early phases of the innovation process. The findings of this essay suggest that moderating ideation entails different types of interventions directed at organizing and managing the front-end of innovation in a distributed manner. These findings highlight how moderators’ interventions are crucial not only to influence and facilitate idea search and idea generation, but also to realize valuable ideas as innovations. Moreover, the findings of this essay identify key antecedents of moderating ideation which need to be taken into account, as they may have an influence on how moderators execute their role and, in the extension, on ideation performance. Finally, this essay identifies and discusses three key paradoxical issues of moderating ideation and moderators’ related strategies to manage them: (1) search behavior focus; (2) the extent of direction in driving search behavior; and (3) goal-setting to influence employees’ ideation efforts. By unfolding these tensions, this study contributes to the discussion about managing tensions at the front-end of innovation (Bjork et al. 2010; Björk et al. 2014; van den Ende et al. 2014). Besides, the findings of this essay are important to better understand how IMS can be sustained and managed over time. As such, they provide key insights on how to better organize and manage the front-end of innovation when using new technologies such as IMS (van den Ende et al. 2014). Overall, these findings indicate the importance of investigating emerging moderating roles when employing IMS at the front-end of innovation, as they may influence the generation, maturation and selection of employees’ ideas with their actions and choices.

Current innovation research has mainly focused on investigating roles supporting innovation in more traditional settings (Howell and Higgins 1990; Hargadon 2002; Howell and Boies 2004). The diffusion of the internet and of new technologies for innovation, however, opens up opportunities for facilitating the innovation process in virtual and more distributed settings (Whelan et al. 2011). As such, a better understanding of these moderating roles and their characteristics is needed.

The third essay addresses the research question: “*How do the heterogeneity of contributors to an idea and the characteristics of the idea itself affect an organization’s decision to select it for funding?*”. The findings of this essay contribute to innovation management research and social network theory by showing the importance of considering both contributors’ diversity and the characteristics of an idea as key mechanisms affecting idea selection. Several network studies have mainly focused on examining the structural characteristics of idea networks and their effect on ideation performance (Perry-Smith and Shalley 2003; Burt 2004; Perry-Smith 2006; Bjork et al. 2011). However, these studies often neglect to consider the key role of content – i.e. the diverse experiences, competences and expertise held by contributors (Rodan and Galunic 2004; Tortoriello et al. 2015). This essay contributes to current research by examining how different types of contributors’ knowledge diversity may mature ideas better for selection. The findings show that the diversity brought by contributors in terms of functional knowledge domains and expertise is beneficial for idea selection. Conversely, other types of contributors’ characteristics – i.e. their geographical locations and status – do not bring additional benefits to idea selection. Hence, these findings show the importance of considering the resources that are mobilized around ideas in terms of contributors’ diversity. This is especially salient considering the increasing diffusion of new technologies for innovation which enable individuals to virtually collaborate and interact to refine initiated ideas (Deichmann and van den Ende 2014). Moreover, this essay contributes to innovation

management research by showing that certain characteristics related to the way an idea is formulated and framed by the submitter as well as its type may also affect idea selection. However, current studies place limited attention on investigating aspects related to idea formulation and content (Goldenberg et al. 2001; Gatignon et al. 2002; Blair and Mumford 2007). Overall, the findings of this essay contribute to innovation management literature by shedding more light on the factors affecting idea selection at different levels.

## **2. Managerial Recommendations**

The use of IMS involves “human beings, human judgments and human motivations. Therefore, like any other managerial tool, the success depends largely upon the managers” (Reuter 1977, p.89). As such, managers play a key influential role when it comes to the use and performance of IMS.

Overall, the findings of this thesis have important practical implications and thus can be used by practitioners in order to: (1) better prepare organizations in the strategy development and implementation processes of their IMS; and (2) understand how to use IMS to properly organize and manage the front-end of innovation process. Managers involved in the IMS development and implementation process may employ the conceptual model developed in the first essay as a cognitive tool to direct and support their decision-making processes. Moreover, they may compare their decision criteria with those of the organizations included in this essay. More specifically, the first essay sheds more light on key dimensions of IMS which managers need to take into account, not only in relation to the design of the system but also to its implementation and integration within the organization. I posit that a pitfall is to wrongly assume certain aspects of the development and implementation process to be easy or less relevant leading to the risk of disregarding them. I also suggest that organizations should carefully make sense of the purpose of employing IMS internally.

The findings of the second essay highlight the importance for managers of establishing informal roles for the maintenance of IMS to ensure their sustenance over time. These findings may be used by both moderators and management as guidelines to better organize and manage the different phases of the front-end of innovation process through the use of IMS. On the one hand, they identify key emerging tensions that moderators need to manage especially with regard to how to organize the search for ideas and how to foster employees' engagement. On the other hand, I suggest that managers need to pay attention to the design of these emerging 'leadership' roles. For instance, they need to consider how to motivate employees to become moderators as well as clarify related responsibilities. This is especially beneficial to improve the functionalities of IMS and, in the extension, increase ideation performance.

Finally, the findings of the third essay suggest the importance of fostering virtual collaboration among diverse and distributed employees. As such, IMS should be designed to encourage diverse types of interactions among distributed employees (especially of a cross-functional nature) rather than to merely foster the generation and collection of ideas. In this respect, I posit that managers should pay attention not only to the characteristics of the submitters but also to contributors to ideas, as these may bring different knowledge and expertise which may be beneficial to further refine ideas before their selection. Moreover, these findings indicate the importance for managers of considering aspects related to the formulation of ideas, such as their length, positive and negative framings, and type. This is to ensure, for instance, that an idea is properly elaborated by the submitter - providing all the necessary details - but without becoming too long and redundant (Haas et al. 2014). Finally, this essay suggests that managers may also use IMS for internal process innovation and thus as a way to capture and handle those internal process-related improvements that otherwise would not have a formal structure to flow into (Davenport 2013).

### **3. The General Research Question**

After summarizing the key implications of the three essays, I return to the general research question: *“How does the use of idea management systems in large organizations contribute to shape and support the process of search, generation, maturation and selection of employees’ ideas?”*. Accordingly, I narrowed this question by focusing on large organizations and on the front-end of innovation process.

In this thesis I focused on addressing different gaps in the innovation management research. First, while current research mainly focuses on how to access and manage external sources of innovation, less attention is placed on the possibilities for innovation and problem-solving coming from internal sources (Neyer et al. 2009; Bjork et al. 2010; van den Ende et al. 2014). I addressed this gap by providing a more comprehensive understanding of IMS for innovation. More precisely, I discussed the potentialities of employing IMS internally to expand intra-organizational search efforts for ideas and solutions and thus access the internal crowd of distributed employees. Moreover, I showed how employees can play a key role not only in generating ideas, but also in helping to further mature and refine others’ ideas through their contributions (Deichmann and van den Ende 2014). Second, prior innovation studies have typically focused on one aspect of investigation in IMS research – i.e. which variables affect the quality and quantity of ideas generated or implemented (Axtell et al. 2000; Bjork and Magnusson 2009; Girotra et al. 2010; Bjork et al. 2011; Blohm et al. 2011). Such focus implies that these studies have mainly considered innovation as an outcome, while disregarding the process through which ideas are generated, matured, selected and implemented (Garud et al. 2013). Relatedly, I contribute to current research by unfolding the initial phases of innovation – the fuzzy front-end – both in terms of its process and its outcome (i.e. the selection of ideas). While current studies recognize the opportunities of using IMS at the front-end of innovation, they seldom address how they enable organizations

to support, manage and organize such process in different ways (Van Dijk and Van den Ende 2002; Boeddrich 2004; Sandstrom and Bjork 2010; van den Ende et al. 2014).

Taken together, my findings document that IMS are used for different reasons and in different ways to support and organize the front-end of innovation in large organizations. Throughout the three essays I show how this depends, for instance, on: (1) the various motivations, interpretations and decisions driving managers' adoption of IMS; and (2) the presence of key emerging roles for facilitating and managing the early phases of the innovation process. Also, I show how specific idea-level, contributor-level and submitter-level characteristics contribute to explain the selection of ideas on IMS. These findings indicate that using IMS to support, organize and manage the front-end of innovation requires attention to matters of strategy, processes and roles as well as to human and social capital arguments (Mumford 2011). As such, it requires organizations to adopt an holistic approach to the front-end of innovation (Khurana and Rosenthal 1998). In the context of IMS, this means considering the process of search, generation, development and selection of employees' ideas as a whole process which is influenced by "how managers think about, use and experience these systems" (Deichmann 2012, p. 19). Thus, managers play a key influential role in this process. For instance, they can directly influence the way IMS are designed, developed and implemented and for which purposes they are employed. Moreover, they can introduce specific roles for the maintenance of these systems, which have the responsibility to facilitate and guide employees' ideation efforts in distributed manners. At the same time, they can influence this process indirectly by creating the conditions for employees to virtually collaborate and interact across diverse locations, levels and functions, hence enabling different types of knowledge diversity to be shared. The three essays show that employing IMS at the front-end of innovation requires managers to make strategic choices in relation to their use already at the beginning of their emergence. In the same way,

it requires moderators to make decisions about how to facilitate and manage the front-end of innovation in the most effective way and how to handle emerging tensions. Besides, my findings reveal the importance of seeing innovation as a social process when employing IMS, which can be beneficial for the maturation and selection of ideas. Overall, addressing these aspects is also important because they may have consequences on the outcomes and performances of IMS. The fact that current studies have only focused on the outcomes or benefits of these systems does not allow to unfold the various strategies, mechanisms and complexities which underlie the use of IMS at the front-end of innovation (Mumford 2011; Garud et al. 2013). The findings of this thesis constitute a step forward in this direction.

Furthermore, I suggest that the findings of this thesis may have broader implications for innovation management research. Many of the aspects discussed throughout the three essays may be extended and further analyzed in the context of other technologies for innovation used to search outside the organizational boundaries, such as crowdsourcing platforms (Poetz and Schreier 2012) or external online ideation platforms (Bayus 2013; Dahlander and Piezunka 2014). In fact, aspects such as how to design incentive mechanisms to engage employees in innovation, how to organize the search for ideas across boundaries and how to handle submitted ideas, are in line with what discussed by current literature in relation to the use of these external platforms.

In conclusion, I suggest the importance for innovation management research of considering the two following aspects:

1. The need to broaden the innovation management agenda and to adopt a wider perspective to investigate not only opportunities for organizational search residing outside the organizational boundaries, but also internally. This thesis shows that large organizations can benefit from performing a broader search for ideas and solutions

within their organizational boundaries by accessing the internal crowd of distributed employees working beyond the R&D department.

2. The need to narrow the research scope toward the key question of how to manage and organize the front-end of innovation process through the use of new technologies for innovation. While my findings provide important insights on this question, more research is needed on the different phases of this process and underpinning mechanisms, tensions and challenges.

Considering the limited knowledge about the role of IMS for innovation, the findings of this thesis appear essential to further advance the innovation management literature and, more generally, organizational research. I bring attention to the importance of unfolding the front-end of innovation process and how it is shaped by the diffusion of new technologies for innovation such as IMS. Yet, there are several opportunities to for future research. This thesis constitutes the starting point for engaging in further research on IMS for innovation.

#### **4. Limitations**

I mainly discussed the limitations of this thesis in each individual essay. However, it is important to highlight some limitations for the thesis in general. First, my empirical focus has been the Scandinavian context, as I collected data from five large organizations in Denmark and one large organization in Sweden. More research is needed in other organizational contexts in order to understand whether these findings may apply in different settings. Second, it is important to highlight the existence of certain contingency issues, especially in relation to size and industry. In this thesis I focused on the role of IMS for innovation in large, international organizations. This, however, opens up the question of when and how it is beneficial to use these systems and whether the same benefits may be observed in smaller organizations. Moreover, the organizations included in this thesis are mainly from knowledge-intensive industries and they all belong to the manufacturing industry. The only

exception is one organization which belongs to the consulting industry. As such, this opens up the question of whether there may be differences in the usage of IMS across industries - for instance, in terms of the nature of the innovations generated. An interesting area of investigation for future research could be to compare B2B and B2C industries to examine whether there are differences in the way organizations develop and use IMS for innovation. Third, while unfolding the role of IMS at the front-end of innovation, I mainly focused on the view of managers in charge of developing and implementing such systems as well as on the view of moderators responsible for their maintenance. As such, while important employee-related aspects have emerged from the analysis – for instance, in terms of employee motivations and behaviors – I could have gained more direct and richer insights by also including the views of employees participating to IMS. While this was not the focus of this thesis, addressing the experiences of participants, their motivations, perceptions, behaviors and cognitive styles may provide important insights on the front-end of innovation process. This constitutes the next step in my research where I plan to collect survey data to further examine these important employee-related aspects.

## **5. Suggestions for Future Research on IMS**

While this thesis sheds more light on the role of IMS for innovation, different aspects remain unaddressed. As such, this opens up a number of opportunities for future research.

First, a better understanding of this important phenomenon may require an investigation of IMS at different levels of analysis, such as employees or IMS providers. For instance, while the first essay focuses on the process of design, development and implementation of IMS, it could be interesting to investigate employees' interpretations and behaviors toward their adoption. This may enable to shed more light on employees' expectations toward such systems and which aspects may influence their participation and engagement. Second, more

research is needed on the dynamics of IMS. For instance, a main limitation of the third essay was to use cross-sectional data to examine idea selection. Future research could further investigate the evolution of idea networks and their consequences on ideation performance by collecting more longitudinal data. Third, while in the third essay I examined important idea characteristics, I did not consider the nature of the ideas generated. It could be interesting to analyze the relationship between the nature of an idea (incremental and radical) and its selection. Similarly, in the second essay I showed how the way moderators manage the front-end of innovation through IMS may have consequences on ideation performance and may lead to the risk of favoring more incremental innovation. More research is needed on how IMS can be used to foster the generation of both radical and incremental ideas and which factors may influence such process. For instance, a key question is how to design proper evaluation and selection mechanisms that allow to manage both types of ideas (Bjork et al. 2010). Moreover, a key finding of the third essay is that the length of an idea description affects its selection. I suggest that future research should explore more in depth the content of an idea – i.e. the way an idea is framed and formulated by the submitter. As a next step in my research, I plan to use text analysis software programs to further address this important aspect. Fourth, while I mainly focused on internal IMS, an interesting avenue for future research may be to address the question of how to integrate internal and external IMS to simultaneously access both internal and external sources of innovation (Neyer et al. 2009; van den Ende et al. 2014). Fifth, while I focused on idea selection as the main outcome variable, a key question is what happens after an idea is selected and transferred into the traditional innovation funnel. Hence, more research is needed on the actual implementation process of selected ideas. Sixth, while more recent innovation studies focus on the characteristics of idea submitters (Bayus 2013; Deichmann and van den Ende 2014), little attention is placed on investigating other roles that may be relevant for IMS. For instance,

while some individuals may be better at generating ideas, it may be argued that others may be better at providing comments to assist and help submitters improve their ideas. Thus, some individuals may be more inclined to use these systems for pro-social behaviors. It could be interesting to explore the behaviors, perceptions and attributes not only of submitters, but also of contributors and other types of participants to these platforms. Finally, another important avenue for future research is linked to the findings of my third essay. I found that attracting high-status contributors to an idea (i.e. employees occupying a higher position in the formal rank) does not affect idea selection. One possible explanation for this finding may be that these individuals participate to an idea to signal whether they endorse it (or not) rather than to bring valuable content that can help improve it. To further explore this, I intend to specifically examine the role of status and endorsement for idea selection.

In general, further understanding how IMS are used at the front-end of innovation constitutes an important area for future research. It may be argued that these systems may lead to “new forms of organizing” for innovation internally (Zammuto et al. 2007, p. 749), somewhat similar in characteristics to the semi-formal organization suggested by Biancani et al. (2014). These systems may favor the creation of new work relations and collaboration opportunities across different parts of an organization and thus may drive innovation in new ways (Biancani et al. 2014).

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