BLEKINGE TEKNISKA HÖGSKOLA

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Masters in Innovation, Entrepreneurship and Business Development

An Emerging Innovation Agenda: Leveraging Intrapreneur's Influence on the Dynamic Capabilities of a Company

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Abstract

Purpose: The purpose of this paper was to identify and establish the relationship between intrapreneurs and the Dynamic Capabilities (DC) framework in a company. This relationship aided us in exploring whether intrapreneurs could positively influence the sensing, seizing and transforming of innovations.

Findings: This paper explored and identified a possible applicability of intrapreneurial theory and dynamic capabilities in the Innovation Value Chain. Ten intrapreneurial skills that could be carried out by an Innovation Agent (IA) in various parts of the innovation chain were identified. The results showed how these intrapreneurial skills could positively influence the dynamic capabilities and contribute to an improvement in sensing, seizing and transforming of idea in full-scale innovations. Although it was shown that intrapreneurs positively influence the sensing, seizing and transforming as separate elements of the dynamic capabilities framework, it was also discovered that intrapreneurs play a crucial role in managing the 'dynamic capabilities' and 'Innovation Value Chain' as a whole. They do this by synthesizing and connecting the separate elements. In addition, a roadmap illustrating the focus areas of these intrapreneurial skills within the innovation chain was formulated during the study.

Research Implications: The research findings contribute to the understanding the Innovation Value Chain through the lens of the Dynamic Capabilities Framework which consists of sensing, seizing and transforming and how the role of intrapreneurship could positively influence the dynamic capabilities and contribute to a better innovation process.

Practical Implications: The practical implications of this study contribute to the innovation management of big high tech global companies. The use of intrapreneurs contributes to addressing the bureaucracy and innovation barriers that big companies usually create as part of their organizational structure and culture. Although it was discovered that all employees and managers should act as intrapreneurs, the research showed that in big global companies there is a need for a separate role of Innovation Agent, who would be responsible for seeing the 'big picture of the innovation process', supporting and navigating the employees with innovative ideas through the complexity of innovation process, and playing diverse intrapreneurial roles in order to creatively address the barriers to innovation in the company.

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We are extremely grateful to all of our interviewees who volunteered their time to provide us with rich and insightful information. All participants demonstrated the type of people who engage in the field of innovation, each of them demonstrating and embodying a profound awareness, respect and pro-activeness for engaging innovation within the company.

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Glossary

Dynamic Capabilities: 'The (inimitable) capacity firms have to shape, reshape, configure and reconfigure the firm's asset base so as to respond to changing technologies and markets. Dynamic capabilities relate to the firm's ability to proactively adapt in order to generate and exploit internal and external firm specific competences and to address the firm's changing environment' (Teece, 2007).

Intrapreneurs: An entrepreneur inside an existing company, who uses entrepreneurial skills without incurring the risks associated with those activities. Intrapreneurs are usually employees within a company who are assigned a special idea or project, and are instructed to develop the project like an entrepreneur would. Intrapreneurs find ways to get resources and capabilities at their disposal in order to move the ideas forward.
Intrapreneurs are any of the 'dreamers who do.' Those who take hands-on responsibility for creating innovation of any kind within an organization. They may be the creators or inventors but are always the dreamers who figure out how to tum an idea into a profitable reality (Pinchot III, 1985, ix).

Intrapreneurship: Practice of including entrepreneurial behaviours and characteristics inside the company, often in the company employees and encourage them to act as entrepreneurs within the company (Thornberry, 2001).

Innovation Agent (IA): An intrapreneur whose role is to 'innovate' the Innovation Value Chain in order to improve the innovation climate and performance within the company. See Intrapreneurs.

Innovation Value Chain: 'This is a framework for evaluating innovation performance which comprises of three main phases of innovation (idea generation, conversion, and diffusion) as well as the critical activities performed during those phases (looking for ideas inside your unit; looking for them in other units; looking for them externally; selecting ideas; funding them; and promoting and spreading ideas companywide).' (Birkinshaw and Hansen, 2007).

Table of Contents

Abstract 2
Acknowledgements 3
Glossary 4
List of Figures 7
List of Tables 7
I. Introduction 8
1.1 Background 8
1.2 Problem Discussion 9
1.3 Problem Formulation and Purpose 12
1.4 The Purpose of the Study 14
1.5 Thesis Structure 15
2. Theoretical Background 16
2.1 Dynamic Capabilities and the Innovation Process 16
2.1.1 What are Dynamic Capabilities? 16
2.1.2 The Needs and Competitive Advantage of Dynamic Capabilities 17
2.1.3 The Dynamic Capabilities Framework: Sensing, Seizing and Transforming 17
2.1.4 Dynamic Capabilities and Strategic Management 22
2.2. Intrapreneurs: The Importance in the Innovation Process 25
2.2.1 Intrapreneurship and Innovation 25
2.2.2 Differentiating Intrapreneurship from Related Concepts 30
2.2.3 Barriers and Gateways to Intrapreneurship 32
2.2.4. Beyond Traditional Intrapreneurship – The Concept of Co-intrapreneurship 34
3. Research Methods 36
3.1 Overview of Research Process 36
3.1.1 The Theoretical Process 36
3.1.2 The Empirical Process 38
3.2 Research Population and Sample 39
3.3 Data Collection 39
3.3.1 Literature Review 39
3.3.2 Semi Structured Interviews 40
3.4 Data Analysis 40
3.4.1 Our Qualitative Data Analysis Process 41
3.4.2 Mapping the Dynamic Capabilities 43
3.5 Methodological Limitations 44
3.6 Expected Results 45
4. Case Description 46
4.1 Overview of Communic8 46
4.2 The TUC Division 46
4.3 The Innovation Value Chain of Communic8 47
4.3.1 Innovation Incentivizing Activities 48
5. Analysis 52
5.1 Barriers in The Innovation Value Chain based on the Barriers to Intrapreneurship 52

5.1.1 Identified Barriers That Affect The Sensing of Ideas in Innovations 53
5.1.2 Identified Barriers that Affect the Seizing of Ideas in Innovations..... 57
5.1.3 Identified Barriers that Affect the Transforming of Ideas in Innovations . 59
5.2 The Intrapreneurial Influence on Addressing the Barriers and Leveraging the Enablers in Dynamic Capabilities..... 61
5.2.1 Identified Positive Influence on the Sensing of Opportunities..... 61
5.2.2 Identified Positive Influence on the Seizing of the Opportunities 64
5.2.3 Identified Positive Influence on the Transforming of the Opportunities into Innovations..... 68
5.3 Shell GameChanger Case: Example of Institutionalized Intrapreneurship... 70
5.4 Who Should Play the Role of Intrapreneur? 73
6. Conclusion and Implications..... 75
6.1 Summary of Findings..... 75
6.2 Managerial Implications and Future Research 76
6.2.1 Intrapreneurial Skills and Dynamic Capabilities..... 80
6.3 The Findings and the Problem Formulation 81
6.4 Conclusion 83
Bibliography..... 84
Appendix..... 93
Appendix A: List of Interview Respondents 93
Appendix B: Interview Guides..... 93
Interview Guide 1..... 93
Interview Guide 2..... 95
Appendix C: Communic8's Vision 96
Appendix D: The Rating Grid 97

List of Figures

Figure 1.1 A Summary of the Research Theoretical Framework 14
Figure 2.1 Foundations of the Dynamic Capability Framework …… 20
Figure 2.2 The Impact of Competences and Capabilities on Strategic Management.....23
Figure 2.3 Dynamic Capabilities and the Managerial Process 24
Figure 2.4 The Underlying Conflict of Intrapreneurship: The Individual vs.the Organizational Level…….....….33
Figure 3.1 Interaction Model for Research Design.....37
Figure 3.2: The Research Process…….....….39
Figure 3.3: Data color coding…… .....…...42
Figure 3.4: An Extract from the Data Matrix illustrating the Data Reduction Process…. 44
Figure 4.1: Overview of Communic8's structure……. 48
Figure 4.2: Communic8's Innovation Value Chain……....49
Figure 6.1 Innovation Agents Roadmap within the Dynamic Capabilities Framework…… 74
Figure 6.2: Intrapreneurial Skills per Dynamic Capabilities……. 76

List of Tables

Table 2.1 The Eight Dimensions of Intrapreneurship (Antoncic and Hisrich 2003)..27
Table 2.2 Terms used to describe the Phenomenon of Entrepreneurship within Existing Firms…….……29
Table 2.3 Differentiating intrapreneurship from related concepts Antoncic and Hisrich, 2003…….....31
Table 2.4 Summarizing the Ten Identified Barriers to Intrapreneurship…… 32
Table 6.1 *The 10 Intrapreneurial Skills defined by Cluster…….. ……..75*

I. Introduction

1.1 Background

'Innovation is increasingly considered to be one of the key drivers of the long-term success of a firm in today's competitive markets' (Jimenez and Valle, 2008, 389). It is one of the most important organizational processes and a principal mechanism for strategic change and growth (Kim, Song and Nerkar, 2011). Innovation, and particularly radical innovation, contributes to organizational rejuvenation (O'Connor and Ayers, 2005) and brings companies 'exceptional competitive position in the market' (Menzel, 2007, 9).

Presently, in the global competitive battle on the market, companies are in a continuous search for strategies to best adapt to the changing business conditions while maintaining a sustainable competitive edge to their products and services (Popadiuk and Choo, 2006). There are no doubts that innovation is a necessary asset for the survival and competitiveness of companies (Teece, 2007). However, large companies, even when they have a solid history and achievements in innovation, 'may create organizational mechanisms that hamper innovation' (Conceição, Hamill, and Pinheiro, 2002, 25). In some cases this is due to their size, which can often hinder their ability to flexibly respond to the changes and thus affects their ability to innovate (Figueroa and Conceição, 2000). Scholars (Thornberry, 2001, 526) speak about the need for big companies to develop entrepreneurial behaviors in order to address 'the staleness, lack of innovation, stagnated top-line growth, and the inertia that often overtakes the large, mature companies of the world'. Entrepreneurial actions within an existing company are referred as 'intrapreneurship' (Pinchot, 1985). Without this kind of activities innovation remains aspirational (Pinchot, 1985; Thornberry, 2001), and the ideas generated do not move forward to being executed.

Closely interlinked with entrepreneurial behavior are the capabilities that allow the company to mobilize resources and respond efficiently to the changing external environment. Teece (2007) refers to these capabilities as Dynamic Capabilities (DC). Recent research links DC to the innovation capabilities of the company (Ellonen, Jantunen and Kuivalainen, 2011)

Given the importance of intrapreneurial actions and the DC to adapt and innovate for the fast-changing environment, we look at the use of intrapreneurs (in this paper referred as Innovation Agents - IA) to enhance the DC of a company.

1.2 Problem Discussion

The following discussion focuses on several problems that identify the need for IA in a company in order to enhance the DC. Namely:

- The need for companies to systemically master the complexity of the innovation process (Ahmed, 1998; Berkhout, Van Der Duin, and Hartmann, 2007; Bernstein and Singh, 2008; Galanakis 2006; Milling, 2001) and continually innovate in order to remain competitive (Menzel, 2007) and do that fast enough, as time is a strategic factor for gaining and maintaining a competitive advantage (Milling, 2001);
- The need to address the inertia that comes from risk aversion, competency trap and path dependency (Wei, 2006), which are inherent of big companies (Conceição, Hamill, and Pinheiro, 2002) and serve as innovation inhibitors (Assink, 2006);

The dynamic environment enacts the need for companies to demonstrate high flexibility, and capability to react fast and to effectively allocate and redeploy internal and external competences and resources in order to respond to the fast changes that come from customers, competitors, regulators and other stakeholders (Barreto, 2010). Research has shown that innovation is one of the most critical approaches for companies to create value in the dynamic environment and remain competitive (Kim, Song and Nerkar, 2011).

Coping with the dynamic environment and the pressure to innovate is not a straightforward task for companies. Efforts to drastically increase the development speed of new products and innovations result in increased demand for resources and lead to many hidden costs (Rothwel, 1994). Under conditions of increasing resource constraints, the company challenge is to accelerate product development and innovation rates in an intensely competitive environment, without significantly multiplying the costs (Noori et al, 2009). To further understand the complex nature of the innovation system, one needs to be aware that the innovation process within a

company cannot be optimized and accelerated by simply importing innovation best practices (Birkinshaw and Hansen, 2007). Instead it requires developing a tailored, end-to-end approach to generating, converting, and diffusing ideas (Birkinshaw and Hansen, 2007).

In order to respond to the previously mentioned complexity large companies have designed administrative and formal systems; and communication chains that have allowed them to optimize the tasks of manufacturing and distribution over large volumes (see Menzel, 2007). The formal systems, routines and the hierarchy have enabled companies to build competences and excel in their operations in a stable environment (Hamel, 1999). Alternatively, those core competences, built on routinized tasks, could 'become core rigidities[1] that limit its ability to adapt to a changed environment' (Hill and Rothaermel, 2003, 260), because often the result is a culture in which companies find it easier to keep on exploiting what has been proven to work and not explore the unknown and innovate (Stevenson and Gumpert, 1985). Consequently, companies become path dependent and get caught in competency traps (Wei, 2006) and risk aversion (Menzel, 2007). The traps and path dependency (Danneels, 2002) are common for technology companies and can act as innovation inhibitors (Assink, 2006).

In order to avoid the competency trap, companies need to actively renew their capabilities to adapt to the changing customer and technological opportunities (Teece, Pisano and Shuen, 1997; Teece, 2007). The abilities to renew the competences of the company and adopt to the changing environment are known as DC and entail the ability: '(1) to sense and shape opportunities and threats, (2) to seize opportunities, and (3) to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise's intangible and tangible assets' (Teece, 2007, 1319).

Danneels (2010) described the dynamic capabilities as the 'ability of a firm to renew itself in the face of a changing environment'. In the field of strategic management, the dynamic capabilities answer the question how firms achieve and

[1] Flip side of core competencies, and caused by overreliance on any advantage(s) for too long. While a successful firm's management relaxes its improvement efforts, others keep on getting better and obsolete its competitive advantage (The Business Dictionary n. d.)

sustain competitive advantage in a changing environment (Teece, Pisano and Shuen, 1997). DC are an extension to the Resource Based View (RBV), which is traditionally linked with a static environment (Barreto, 2010). The RBV advocates the notion that company's competitive advantage is based on their resources and capabilities distributed throughout the company and the ability to maintain those assets 'costly to imitate and non-substitutable' (Barreto 2010, 259). However, sustaining a competitive advantage in dynamic, rapidly changing markets by relying on static assets is almost impossible because the environment evolves so quickly that it imposes urgent need for quick responses and changes by the companies (Barney, Wright, Ketchen, 2001). In other words, relying on the static RBV to remain competitive is not enough (Barreto, 2010). Hence, research in the field of DC, as a concept that supports gaining and sustaining a competitive advantage in the changing environment, is receiving increasing attention (Barreto, 2010). Yet research reports that the despite the growing interest in researching the DC concept, the concept remains vague (Kraatz and Zajac, 2001). Teece (2007) mentioned the connection DC with an entrepreneurial perspective to build up dynamic and elastic capabilities on the static RBV.

In the light of the entrepreneurial perspective, we explore the importance of evoking entrepreneurial skills within existing organizations. McFadzean, O'Loughlin and Shaw (2005) researched the concept of intrapreneurs as a driving force to revitalize the companies, to support risk taking, innovation and proactive competitor behavior (Guth and Ginsberg, 1990; Zahra and Covin 1995, 44). However, despite the recognition of the importance that intrapreneurs have in the innovation performance in a company (McFadzean, O'Loughlin, and Shaw, 2005; Camelo-Ordaz et al., 2011), there are still theoretical gaps in the field (McMullen, Plummer, and Acs, 2007). Recent research (Camelo-Ordaz et al., 2011) confirms that the analysis of the influence that intrapreneurs have on the innovation performance of the company is a field that is not thoroughly covered by the research (Srivastava and Lee, 2005). Although several scholars who have addressed corporate entrepreneurship (Ireland, Duane and Kuratko, 2009; Zahra, 1993) have made significant contributions to the theoretical development, 'there is still scope for a more focused exploration, particularly as there is a growing need for corporate entrepreneurship and innovation within organizations' (McFadzean, O'Loughlin and Shaw, 2005, 350). In addition, most of the research so far has been exploring the independent sides of

entrepreneurship or innovation. Consequently, 'there has been very little comment in the literature on the relationships between entrepreneurship and innovation' (McFadzean, O'Loughlin and Shaw, 2005, 351). Moreover, there is a void in the literature about the relation between intrapreneurship and dynamic capabilities, although the both concepts independently are getting increasing attention in research.

1.3 Problem Formulation and Purpose

Researchers in the field of dynamic capabilities recognized the need to introduce entrepreneurial capacities, as a way to improve the opportunity capturing in the fast competitive environments, where the 'needs, technological opportunities, and competitor activity are constantly in a state of flux sensing' (Teece, 2007, 1322). In the race to innovate, the rapidly changing environment makes it very difficult for companies to forecast results and requires an 'opportunities focused' approach (Thornberry, 2001), one where the companies are on continuous alert for new opportunities. The 'opportunities focused' approach is inherent for entrepreneurs and startups because they were '…built because someone saw an opportunity, and that someone quickly put people and resources together in order to capture that opportunity' (Thornberry, 2001, 530). This leads many authors to highlight that established firms must adopt entrepreneurial strategies (Kuratko et al., 2005) in order to increase the flexibility and ability to innovate (Toledano, Urbano, and Bernadich, 2010). Scholars recognized the need to apply the concept of entrepreneurship in existing companies, known as Corporate Entrepreneurship, or Intrapreneurship (Pinchot, 1985) in order to stimulate innovation within the organization through the 'examination of potential new opportunities, resource acquisition, implementation, exploitation and commercialization of the new products or services' (McFadzean, O'Loughlin, and Shaw, 2005, 351). However it's not sufficient for the opportunities to be only recognized by the technical community. Especially in large-scale organizational projects that have organizational hierarchies and silos, the administrative and technical communities have different, often opposing approaches to interpret and see the value and ROI from the proposed ideas, tasks or events (Drazin, Glynn, and Kazanjian, 1999). Thus, many good ideas that come from the technical department never receive attention from management (Soken and Barnes,

2008). This can serve as basis for explaining why Type I[2] and Type II[3] errors in the innovation process occur i.e. many companies reject potentially successful ideas, or accept for development ideas that are inherently flawed (Bernstein and Singh, 2008). In order to address the possibility of this dilemma, researchers explore the possibility of activating the engineers within large firms as intrapreneurs (Menzel, Aaltio, and Ulijn, 2007) in order to process the idea through the whole innovation process, from generation to commercialization.

This highlights a role in the innovation process, which will be referred to as Innovation Agents (IA) in this study that will bring sense making and intrapreneurial competences in the innovation process. In spite of its relevance, the intrapreneurial role of Innovation Agents is still not well understood theoretically because the literature on the impact of intrapreneurs on innovation remains sparse (McMullen, Plummer, and Acs, 2007). Companies are also faced with the question, who could play the role of an IA. In some cases, the companies strive to motivate each employee to act like an entrepreneur or typically in technology driven firms, engineers (Menzel, Aaltio, and Ulijn, 2007). More often, companies target the managers to act as corporate entrepreneurs (Thornberry, 2001).

Collectively, the practical importance that the intrapreneurs and dynamic capabilities have on the innovation potential of the company, and the vague research in the link between the two, leads the us to ask how could the concept of entrepreneurial behavior within companies be linked to the dynamic capabilities in order to positively influence the innovation performance of the company and to create a culture where innovation can thrive?

Primary Research Question (PRQ): How can Innovation Agents positively influence the sensing, seizing and transforming within the innovation process?

[2] A Type I error in an innovation process occurs as a result when a R&D project or idea that goes through the process, gets deployed to the market via the company's business model and fails (Chesbrough, 2006, 12)

[3] A Type II error occurs when a R&D project or idea, does not align with the company's business model and is not seen as valuable. (Chesbrough, 2006, 12)

Supporting Research Question (SRQ): Who could play the role of an innovation agent and how could they contribute to positively influence the dynamic capabilities of the company?

1.4 The Purpose of the Study

The purpose of the study is to explore the relationship between Innovation Agents and the Dynamic Capabilities Framework. More precisely, the paper aims to identify the contributions that Innovation Agents have on sensing, seizing and transforming opportunities for innovation. We are looking at how the Innovation Agents could positively influence the ability of the company to sense the right opportunities, seize and transform them into innovations, by identifying the critical roles that the Innovation Agents can play in the innovation process.

The study applies the Dynamic Capabilities framework as lens to identify the strengths and weaknesses in the innovation process by looking at the barriers and enablers to sensing, seizing and transforming. This is illustrated below in Figure 1.1.

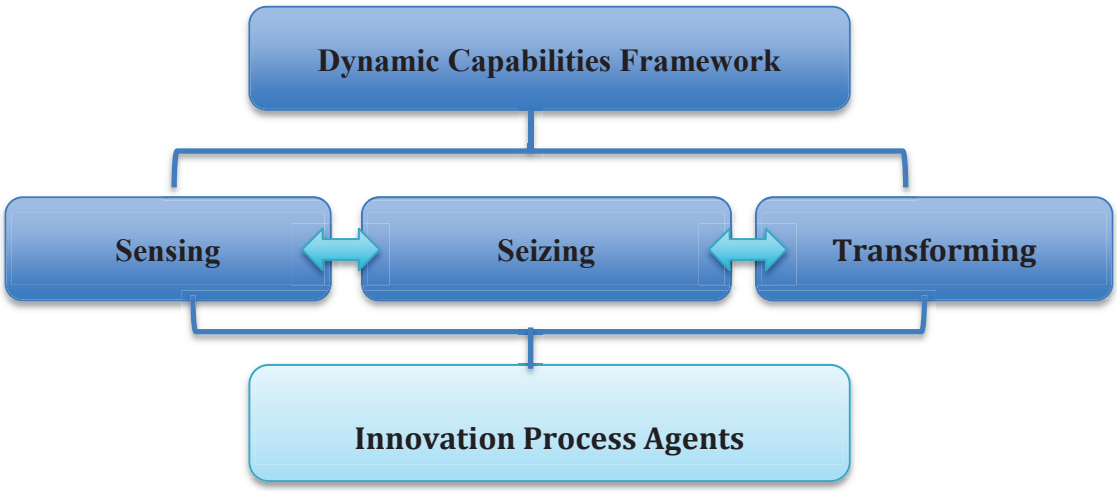


Figure 1.1 A Summary of the Research Theoretical Framework

1.5 Thesis Structure

This section will give an overview of the upcoming chapters of the paper, which are organized as follows:

Chapter 2: Theoretical Background

This chapter gives detailed insights into the theoretical foundations of this study which includes a;

- theoretical overview of Dynamic Capabilities;
- theoretical overview of the Intrapreneurship Concept and how that relates to the Dynamic Capabilities research

Chapter 3: Research Methods:

This chapter gives an insight into the iterative empirical and theoretical design of this study. Additionally, it describes the data collection methods and the data analysis process that was carried out in order to answer the research question stated in section 1.3.

Chapter 4: Case Description

The case description describes and elaborates on Communic8's as a company and then more specifically on its innovation process. Communic8 is the company that was used as the case study to research the problem.

Chapter 5: Data Analysis

Using the DC framework and intrapreneurial theory as a base the results gathered in the data collection phase, were analyzed to identify what they entail on an empirical and theoretical front.

Chapter 6: Conclusion

The conclusion summarizes and connects the problem discussion and the results from the research which are expressed in the summary of findings. Additionally this chapter gives the managerial implications of the study with some suggested areas for future research.

2. Theoretical Background

This section of the research paper will elaborate on the current literature on the two main theories, dynamic capabilities and Intrapreneurship and their relation to the innovation process. They will be the foundation of this research, and their comprehension will allow for a better understanding of this research paper.

2.1 Dynamic Capabilities and the Innovation Process

2.1.1 What are Dynamic Capabilities?

According to Teece (2007, 73) dynamic capabilities can be defined as:
'the (inimitable) capacity firms have to shape, reshape, configure and reconfigure the firm's asset base so as to respond to changing technologies and markets. Dynamic capabilities relate to the firm's ability to proactively adapt in order to generate and exploit internal and external firm specific competences and to address the firm's changing environment'.

These capabilities refer to a firm's ability to constantly adapt and change while taking various factors like changes in customer needs, technological and competitive opportunities in a rapidly changing external environment (Teece, Pisano and Shuen, 1997), by altering its resources (Eisenhardt and Martin, 2000) and knowledge assets (Jantunen, Ellonen and Johansson, 2012).

According research by Winter (2003) they are a crucial element in innovation activities because they are 'higher order capabilities' that are necessary to manage change (Cepeda and Vera, 2007) and govern the rate of change of 'operational level capacities' (Teece, 2007; Teece et al, 1997; Winter, 2003) and learning in new spheres of knowledge. Teece, Pisano and Shuen (1997) explain in their research that a firm that has these capabilities is characterized by the ability to exhibit a quick, prompt reaction and elastic forms of innovation activities that is integrated with managerial capabilities to manage both internal and external competences, and align with the changing and uncertain business environment. Some examples of DC that

can be seen strategic action (Barreto, 2010) in a firm could include product development, strategic decision making and alliance management (Eisenhardt and Martin, 2000).

DC are rooted in the organizational processes (Barreto, 2010) and resource based theory (Peteraf, 1993) of firms, which states that how resources within a firm that are varied in their distribution across the firms can influence the competitive advantage. Jantunen, Ellonen and Johansson (2012) concluded that internal and external resources of a firm influence its opportunities and growth potential.

2.1.2 The Needs and Competitive Advantage of Dynamic Capabilities

Firms are in a situation where they need to survive in the current business ecosystem, which is characterized as being 'hypercompetitive' (Augier and Teece, 2007, 185). The external environment's role in how firms operate is becoming increasingly complex, and internal R&D is no longer sufficient as a competitive advantage (Chesbrough, 2003). Dynamic capabilities are believed to be a key approach when firms are trying to enhance or achieve new forms of their competitive advantage with other firms (Augier and Teece, 2007) in the dynamic environment by improving the day to day practices of the firm. Learning to adapt can be key to the competitive advantage of a firm and to achieve superior performance (Augier and Teece, 2007), avoid the zero profit trap (Teece, 2007) and bring forward new innovations (Jantunen, Ellonen and Johansson, 2012). Collins (1994) and Winter (2003) state that without dynamic capabilities, a firm will not be able to sustain the resources and competencies it has for a long term competitive advantage. Research indicates how it is about how firms can cultivate new skills and routines (Cepeda and Vera, 2007) that enable them to take advantage of these competitive opportunities. This is why there is a need to combine a firm's exclusive DC and knowledge assets in order to have a competitive advantage (Teece, 2007).

2.1.3 The Dynamic Capabilities Framework: Sensing, Seizing and Transforming

In order for dynamic capabilities to be operationalized, Teece (2007) established a framework which classified a firm's capabilities into three sets. The first, sensing is

associated with the sensing of opportunities; seizing is associated with seizing opportunities and finally transformation of the firm's resource or asset base. These groups are similar to those identified by various other researchers. Verona and Ravasi (2003) refer to these sets as knowledge creation and absorption; knowledge integration and knowledge reconfiguration. In DC research conducted by Wang and Ahmed (2007) they also identified three components, which included adaptive capability, absorptive capability and innovative capability. Even though three components seemed to be the trend there was one researcher who developed the framework further and identified four components. Barreto (2010) identified sensing opportunities and threats, making decisions on time, making decisions that are market orientated and lastly the inclination to modify the resource or asset base. All these identified components by the various researchers have much in common, however for purposes of this study, Teece's framework of sensing, seizing and transformation will be used as the main conceptual framework and research by Jantunen, Ellonen and Johansson (2012) will be mentioned to further elaborate on Teece's work.

a) Sensing

Sensing is the first component of the framework where the business environment is monitored and opportunities are sensed. Jantunen, Ellonen and Johansson (2012) state that it deals with a firm's ability to detect emergent opportunities and create knowledge. Sensing opportunities is only part of the process, but it also about sensing the right opportunities, which is no easy task. This is a process that requires learning, interpretation and creative learning (Teece, 2007). Teece (2007) further explains that the ability to identify opportunities is dependent not only on the firm's learning and knowledge capacities but also those of the individuals within the firm. In order for a firm to have an effective sensing process the individuals in the firm must have the right skills to complement the firm's knowledge assets. Research states that engaging stakeholders like the customer or supplier in the sensing process can contribute to innovation and they should be integrated into the process (Teece, 2007).

b) Seizing

Sensing the right opportunity is one thing and seizing the opportunity is another. Teece (2007) recognizes the fact that firms may sense an opportunity but may not be able to seize the opportunities in the right manner, as they are two completely

different actions. It is possible that a firm can sense the right opportunities and not be able to seize them at the right time. Jantunen, Ellonen and Johansson (2012) describe this second component as a firm's capacity to adjust and incorporate knowledge and use it to commercial ends. They basically say it is more than just seizing that opportunity, but it is about how it is absorbed into the firm and incorporated with the other variables. As stated in Teece's research (2007) the hierarchical structures and the bureaucratic decision making processes may hinder the innovation process. These processes are usually in place because firms are more comfortable with incremental innovations as opposed to radical innovations, and hence why there is a need for opportunities to be screened first. By delaying the time it takes to seize an opportunity due to the need of approvals from higher order decision makers, a firm may miss out on opportunities.

c) Transformation

Jantunen, Ellonen and Johansson (2012) refer to this as reconfiguration and this third component is the ability of a firm to reassemble resources and knowledge in order for innovation to take place. The transformation stage takes place after the right opportunities have been sensed and seized and it is achieved when these opportunities are addressed in conjunction with firm knowledge assets, competencies and resources. Teece (2007) discusses the concept of co-specialization, or the continuous realignment/strategic fit with the external environment. By this he implies that if the combination of resources, knowledge and competencies are correct to adapt to the external environment, the firm would have successfully realigned itself with the new state. This is what is what would enable a successful innovation.

Figure 2.1 gives a detailed summary of what each of the three components of the DC framework entail in a firm.

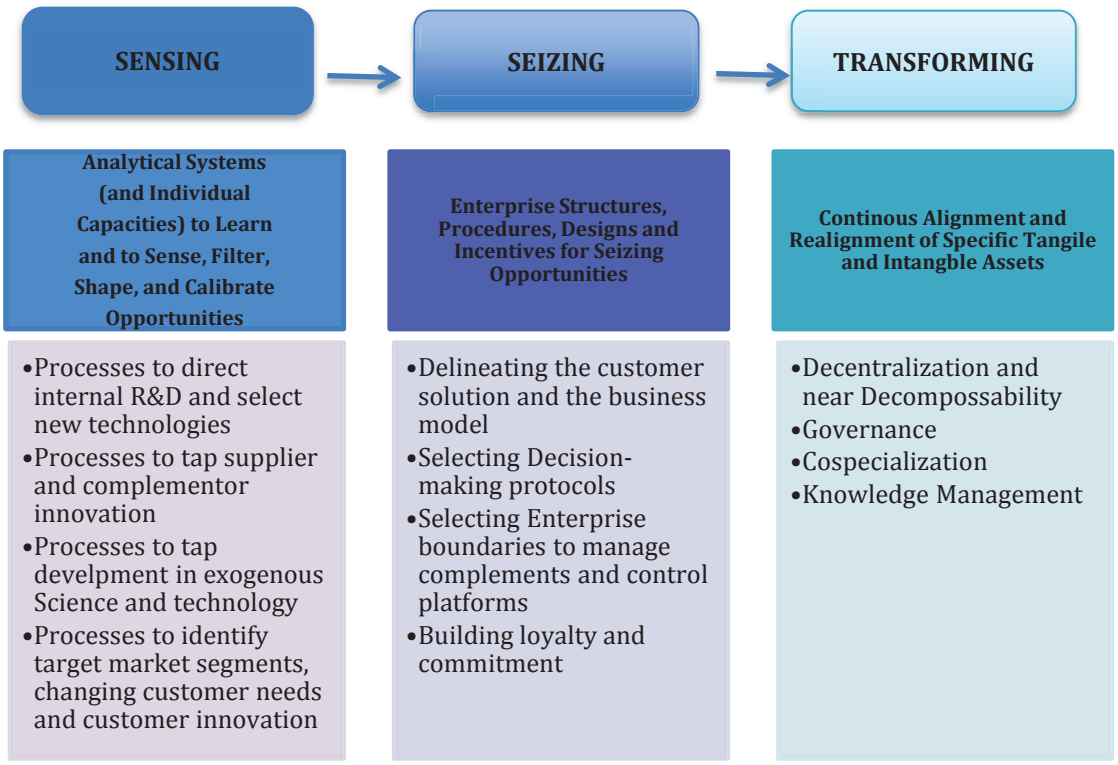


Figure 2.1 Foundations of the Dynamic Capability Framework (modified from Teece, 2007, 24)

There has been a substantial amount of research done in the realm of DC. Augier and Teece (2007) highlight that the framework is rooted in the resource based theory and is believed to contextualize entrepreneurial themes in a firm. In this case a firm is viewed as 'a pool of resources, the utilization of which is organized in an administrative framework' (Augier and Teece, 2007, 176). One of the main premises for linking DC with entrepreneurial capacities is that, entrepreneurs have the ability to see new opportunities in the market that may not be noticed by others (Augier and Teece, 2007). Entrepreneurial skills are believed to enhance the sensing and seizing of opportunities. Teece (2007) in his research states that to manage DC would require entrepreneurial management. Therefore, it may be useful that managerial capacities in a firm incorporate entrepreneurship in terms of getting things into action, innovative ways of doing things, and the sensing and seizing capacities of opportunities that may arise in the dynamic environment.

Despite the extensive development of DC research, Zahra, Sapienza and Davidson (2006) highlight that the research is still in the early stages of development.

There are some gaps, discrepancies and overlaps in terminology. As stated by Winter (2003) the main discrepancy has been around how DC is defined and how they interact with operational capabilities. Teece, Pisano and Shuen (1997) highlighted how the initial definitions DC was closely aligned with having a competitive advantage that stemmed from resources in a shifting environment, however they believed that it was due to the capability of a firm to adapt by establishing new capabilities. However, Helfat and Peteraf (2003) explicitly state that DC influences the performance of a firm when they engage with the operational capabilities. Research has spanned across various aspects of DC ranging from its characteristics, its antecedents, outcomes, and processes, but there had seemed to be a lack of a holistic systems approach that combined this research (Cepeda and Vera, 2007). Jantunen, Ellonen and Johansson (2012), highlight that DC concepts are mainly conceptual and there has not been much done on the actual operationalization of these concepts because no actual practices or process have been identified, or are in cases which are specific to single case studies.

There are also some key assumptions that are made about DC, especially in the case where the definitions have a prescriptive nature and that they can make circumstances in a firm better and therefore contribute to gaining a competitive edge. In other words, as stated by Cepeda and Vera (2007), that if a firm develops its DC it will perform well. Alternatively to perform well in the competitive environment a firm must acquire DC. Another main discrepancy was to what extent that DC of a firm are path dependent and have unique capabilities (Barreto, 2010). Initially Teece, Pisano and Shuen (1997) stated in their research that the ability that firms have to modify their capabilities differs from firm to firm, due to differences in DC. According to research by Jantunen, Ellonen and Johansson (2012) unlike seizing and transformation capabilities which many differ across firms, it is possible that sensing capabilities within firms in a specific industry may be similar. This could have its downfall as firms with similar capabilities address the same challenges the competitive advantage could be lost, and that is why it is important to build and develop their own distinctive capabilities to do well in this context. Alternatively Eisenhardt and Martin (2000) say otherwise and say they are best practices and therefore similarities within varying firms can be identified.

2.1.4 Dynamic Capabilities and Strategic Management

'In the long run the profitability, survival, and growth of a firm, and growth of a firm does not depend so much on the efficiency with which it is able to organize the production of even a widely diversified range of products as it does on the ability of the firm to establish one or more wide and relatively impregnable bases from which it can adapt and extend its operations in an uncertain, changing and competitive world' (see Dodgson, Gann and Salter, 2005, 167)

The above quote encapsulates why it is necessary to have a strategy within firms. Especially, in unpredictable situations which could potentially lead to disruptive consequences. Strategy can help guide decisions about what firms should do and how to go about their operations in order to, attract and maintain customers; and sustain a competitive advantage in such situations. A strategic approach could help with the appropriate selection of business activities and technologies (Dodgson, Gann and Salter, 2005). In cases where firms have 'core' or 'base' activities or resources, these can play a significant role in determining the firm's focus. Based on this, the 'resource based theories of strategies and notions of core competencies' are just one of various approaches (Dodgson, Gann and Salter, 2005, 167) to comprehend strategic approaches to firm's resources.

Over recent years, the DC view of competitive strategy has gained influence in firms. DC have been used to analyze and comprehend strategic management (see Dodgson, Gann and Salter, 2005, 168) and manipulate resource reconfigurations so that core competencies do not become 'core rigidities' (Dodgson, Gann and Salter, 2005). It is stated that firms 'need to reconfigure the assortment of capabilities to face challenges presented by fast changing business' (Weerawardena and Mavondo, 2011, 1220). Through the means of DC, the resources of a firm are reinforced, exploited, developed and expanded (Dodgson, Gann and Salter, 2005). Figure 2.2 illustrates how a combination of competences and capabilities can have an influence or impact on strategic management in a firm.

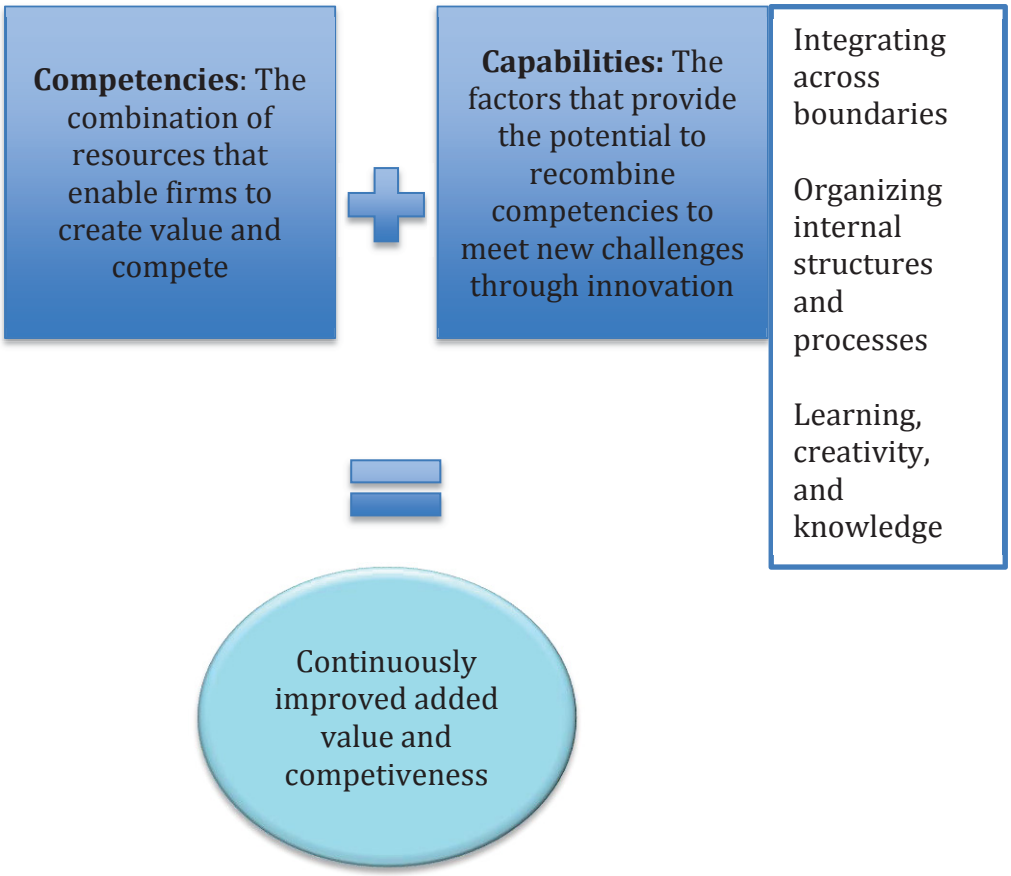


Figure 2.2 The impact of Competences and Capabilities on Strategic Management (modified from Dodgson, Gann and Salter, 2005, 167)

In recent research, perspectives on DC have been focused more on 'the key capabilities that organizations possess and whether or not they add value to the firm' (Helfat et al, 2007, 46). However, questions still persist about 'where and how they change' and there seems to be a gap in regards to what is referred to as a 'people-based view of dynamic capabilities' (Helfat et al, 2007, 46). This looks at the role that individuals in a firm can play as they can potentially deter or stimulate organizational change and the development of dynamic capabilities of a firm (Helfat et al, 2007). There is little research that links managerial behaviors and or skills to organizational processes and DC. By neglecting this fact, there is a risk of not considering whether and how executives and managers behave in order to create, extend and modify the resources base of a firm in a value-creating manner. This may lead to a risk where DC will remain in the abstract (Helfat et al, 2007). It is important to understand the role of managers and executives as the can play a particularly critical role in the innovation

process as illustrated in Figure 2.3. Innovation constitutes different areas of management (Dodgson, Gann and Salter, 2005) and also happens to be one of the key business processes (Helfat et al, 2007). It can be risky and expensive, and it is important that it is managed properly. If the innovation process is not managed well, the innovation outcomes could negatively affect competiveness. Figure 2.3, illustrates the simplified relationship between DC and the managerial process.

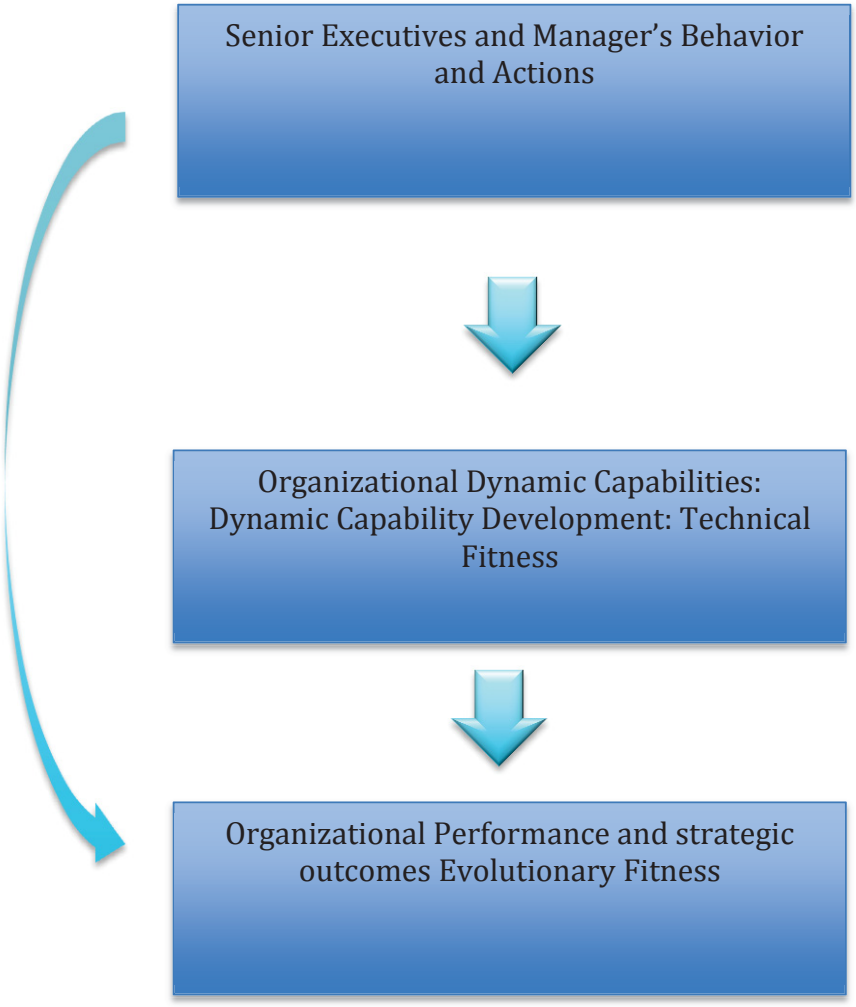


Figure 2.3 Dynamic Capabilities and Managerial Process (Adapted from Helfat et al, 2007)

In some firms, managers have the power to directly or indirectly make decisions on which products and services to offer to the customers and in what form. Their behavior can have an effect on the firm's ability to create, extend, or modify its resource base. This can be done by 'paying special attention to environmental

contexts that sometimes can select, or deselect, which dynamic capabilities are evolutionary fit' (Helfat et al, 2007, 47). Currently, in the business world, managers can contribute to the strategy and performance of a firm especially where there are major discontinuities, dynamic environments and complex situations (Helfat et al, 2007). They can either hinder or contribute to the success of a firm. They need to use every means possible or available to efficiently and quickly produce results. The strategic advantage can be derived from how managers and executives establish and use the base and core set of resources and competencies that can enable them to create value and compete in a dynamic environment. A firm's competencies are adapted and changed over time by its dynamic capabilities. These capabilities are fundamental to facilitate the reconfiguration of new and existing, competencies to meet fresh and new opportunities referred to as capabilities (Dodgson, Gann and Salter, 2005).

Bounded by what is called 'bounded rationality'[4], sometimes managers are not able to identify the changing conditions in their internal and external environment. This can lead to them missing out on sensing, seizing and transforming the right opportunities, or not even being able to react to stimulus in their environment (Helfat et al, 2007). The other obstacle that firms may face is that the managers and executives do not change with the changing environment and they could make decisions that could negatively affect the innovation process. This gives an insight into why managers should be strategic in how they manage their innovation process by using dynamic capabilities.

2.2. Intrapreneurs: The Importance in the Innovation Process

2.2.1 Intrapreneurship and Innovation

The concept of intrapreneurship has been gaining increasing attention in research over the last two decades (Antoncic and Hisrich, 2003). The interest has been caused by the worth that intrapreneurship brings in helping companies regain the lost spark, enhance the speed of innovating (Thornberry, 2001), challenge bureaucracy,

[4] Bounded Rationality explains that the information and time that are available limit the decision-making and rationality of individuals

and encourage innovation (Barringer and Bluedorn, 1999). Innovativeness, pro-activeness and risk taking are three encompassing components of entrepreneurial activities within a company (Zahra and Covin, 1995). Product innovation covers the ability of the company to develop new products and services or to modify the existing solutions in order to respond to the demands of the current and future markets. Pro-activeness brings the ability of the company to perform better than the competitors in bringing new solutions to the market. Finally, risk taking refers to the readiness of the company to undertake actions from which the outcome may not be most certain (Zahra and Covin, 1995).

Intrapreneurship fuels the 'sensing potential for new opportunities, resource acquisition, implementation, exploitation and commercialization of the new products or services' (Guth and Ginsberg, 1990; McFadzean, O'Loughlin and Shaw, 2005, 351-2). An additional benefit from intrapreneurship is its positive effect on the 'revitalization and performance of a firm' (Menzel, Aaltio, and Ulijn, 2007, 733). Without entrepreneurial ability innovation remains aspirational, and although many opportunities are sensed, and ideas may be generated, the seizing and transforming of those ideas into profitable innovations remain weak (Pinchot, 1985; Thornberry, 2001). Therefore, scholars have suggested that the concepts of innovation and entrepreneurial aspirations have to be linked (McFadzean, O'Loughlin and Shaw, 2005). Intrapreneurship is in many cases the foundation and enabler for technological innovations and firm renewal (Menzel, Aaltio, and Ulijn, 2007).

Gapp and Fisher (2007) revealed that the intrapreneurial teams help to address some of the barriers to innovation in companies. Some of the barriers include the organizational structure based on hierarchy, bureaucracy and non-participative management styles (Gapp and Fisher, 2007); complex processes and fear of risk taking (Thornberry, 2001) or evaluation apprehension (Briggs and Reining, 2010). Wunderer (2001, 193) also pointed at intrapreneurship as an alternative to the 'command-and-control' culture and described it as a 'new post-bureaucratic models of organizations, based on co-ordination, emphasize the need for decentralizing authority and development of team-oriented designs'.

These are some of the reasons why many companies have underscored the importance of intrapreneurship in their business and organizational strategies. Companies like 3M, Hewlett, Packard (Robinson, 2001), Google and Genentech are stimulating intrapreneurship (Menzel, Aaltio, and Ulijn, 2007). In IBM, ‘everyone behaves in an intrapreneurial, non-bureaucratic and productive manner‘ (Wunderer 2001, 193).

Antoncic and Hisrich (2003) summarized the research on intrapreneurship in eight dimensions in which intrapreneurship brings benefits for the company. Those are presented in the table below.

Table 2.1 *The Eight Dimensions of Intrapreneurship (Antoncic and Hisrich, 2003, 19)*

Dimension	**Definition**	**Theoretical grounds** *for reference see Antoncic and Hisrich, 2003, 19
New ventures	Creation of new autonomous or semi-autonomous units or firms	Schollhammer (1981) HisrichandPeters (1984) MacMillan et al. (1984) Vesper (1984) Kanter and Richardson (1991) Stopford and Baden-Fuller (1994) Sharma and Chrisman (1999)
New businesses	Pursuit of and entering into new businesses related to current products or markets	Rule and Irvin (1988) Stopford and Baden-Fuller (1994)
Product/service innovativeness	Creation of new products and services	Schollhammer (1982) Covin and Slevin (1991) Zahra (1993) Damanpour (1996) Burgelman and Rosenblom (1997) Knight (1997) Tushman and Anderson (1997)

Process innovativeness	Innovations in production procedures and techniques	Schollhammer (1982) Covin and Slevin (1991) Zahra (1993) Damanpour (1996) Burgelman and Rosenblom (1997) Knight (1997) Tushman and Anderson (1997)
Self-renewal	Strategy reformulation, reorganization and organizational change	Vesper (1984) Guth and Ginsberg (1990) Zahra (1993) Stopford and Baden-Fuller (1994) Muzyka et al. (1995) Sharma and Chrisman (1999)
Risk-taking	Possibility of loss related to quickness in taking bold actions and committing resources in the pursuit of new opportunities	Mintzberg (1973) Khandwalla (1977) MilesandSnow (1978) Covin and Slevin (1986,1989,1991) StopfordandBaden-Fuller (1994) Dess et al. (1996) Lumpkin and Dess (1996,1997) Lumpkin (1998)
Pro-activeness	Top management orientation for pioneering and initiative taking	Covin and Slevin (1986,1991) Venkatraman (1989) Stopford and Baden-Fuller (1994) Lumpkin and Dess (1996,1997) Dess et al. (1997) Lumpkin (1998)
Competitive aggressiveness	Aggressive posturing towards competitors	Covin and Slevin (1986, 1991) Miller (1987) Covin and Covin (1990) Lumpkin and Dess (1996,1997) Knight (1997)

Despite the interest and research on the positive impact that intrapreneurship has on companies, there are still different approaches to defining intrapreneurship. Intrapreneurship, as a concept, was introduced by Pinchot (1985). Pinchot described intrapreneurship as the idea of stimulating entrepreneurial activities within existing organizations. The meaning of word 'intrapreneurship' itself combines the prefix intra meaning inside or within and entrepreneurship. Therefore, describing intrapreneurship as entrepreneurship inside/within an existing organization has been accepted as a general definition (Menzel, 2007). The idea behind intrapreneurship is to include the entrepreneurial behaviors and characteristics inside the company, often in the company employees and encourage them to act as entrepreneurs within the company (Thornberry, 2001). The previous research in the realm of entrepreneurial activities within existing organizations reveals that there are a number of ways to define this concept. Sharma and Chrisman (1999) addressed the problem of not having a consistent term and definition to address the entrepreneurial activities within existing organizations. They summarized the variety of terms that are used to describe the phenomenon of entrepreneurial behavior within existing companies, some of which include: corporate entrepreneurship (Zahra, 1993), Intrapreneuring (Pinchot, 1985), internal corporate entrepreneurship (Jones and Butler, 1992), internal entrepreneurship (Vesper, 1984), strategic renewal (Guth and Ginsberg, 1990). The table below summarizes the most commonly used terms to describe entrepreneurship within existing companies.

Table 2.2 *Terms Used to Describe the Phenomenon of Entrepreneurship within Existing Firms (adapted from Sharma and Chrisman, 1999, 15)*

Term	**Definition and Source**
Corporate entrepreneurship	Corporate entrepreneurship involves employee initiative from below in the organization to undertake something new. An innovation, which is created by subordinates without being asked, expected, or perhaps even given permission by higher management to do so (Vesper, 1984, 295).
Internal entrepreneurship	Internal Corporate Entrepreneurship refers to entrepreneurial behavior within one firm (Jones and Buller, 1992, 734).

	Internal (or intra-corporate) entrepreneurship refers to all formalized entrepreneurial activities within existing business organizations. Formalized internal entrepreneurial activities are those which receive explicit organizational sanction and resource commitment for the purpose of innovative corporate endeavors — new product developments, product improvements, new methods or procedures (see Kent, Sexton and Vesper, 1982, 209-229)
Intrapreneurship	Internal Corporate Entrepreneurship refers to entrepreneurial behavior within one firm (Jones and Buller, 1992, 734). Intrapreneurs are any of the 'dreamers who do.' Those who take hands-on responsibility for creating innovation of any kind within an organization. They may be the creators or inventors but are always the dreamers who figure out how to tum an idea into a profitable reality (Pinchot III, 1985, ix).
Strategic or organizational renewal	Renewal means revitalizing a company's business through innovation and changing its competitive profile. It means revitalizing the company's operations by changing the scope of its business, its competitive approaches or both. It also means building or acquiring new capabilities and then creatively leveraging them to add value for shareholders. (Zahra, 1995, 227)

In this research, we use the term 'Intrapreneurship' as defined by Pinchot (1985) and Jones and Buller (1992).

2.2.2 Differentiating Intrapreneurship from Related Concepts

The research up-to-date does not demonstrate direct connections between the concept of intrapreneurship and dynamic capabilities. There have been attempts to link intrapreneurship with the strategic management concepts: diversification and capabilities concept. While intrapreneurship is considered to be a manifestation of the innovation capabilities, there are some differences between those concepts and intrapreneurship. Mainly, the diversification and capabilities concepts are based on the Resource Based View (RBV) and put emphasize on the static assets that are within the company and assume operating in a customary and predictable environment. Intrapreneurship is the response to the uncustomary and changing (Antoncic and Hisrich, 2003).

Below we present a table that depicts the key similarities and differences between intrapreneurship and the related concepts.

Table 2.3 *Differentiating Intrapreneurship from Related Concepts (Antoncic and Hisrich, 2003)*

Concept	**Key concern**	**Key similarity**	**Key difference**
Diversification strategy	Product/market relatedness of organizational businesses	Changes in diversification focus, especially in terms of entering new, product/market unfamiliar businesses	Product/market relatedness and synergy across organizational businesses not a primary focus of intrapreneurship; intrapreneurship also includes non-product/market-based emergent activities and orientations
Capabilities	Coherent combinations of resources and	Intrapreneurship as a manifestation of organizational	Search for organizational inter-business

	activities across value chains of organizational businesses	innovative capabilities	coherence and synergy not a key concern of intrapreneurship
Organizational learning	Knowledge acquisition and retention, and organizational routines' improvement	Intrapreneurship may create disruptions that are part of the learning process	Building knowledge base, organizational memory and routines not a main concern of intrapreneurship
Organizational innovation	New combinations from the organizational perspective (product, technological, administrative innovation)	Creation of something new in terms of new combinations in production and support activities	Predominant focus of intrapreneurship is also on creation of new ventures; this is not the focus for organizational innovativeness

2.2.3 Barriers and Gateways to Intrapreneurship

Despite the clear benefits from intrapreneurship, research shows that intrapreneurship, especially in the early stages of business development can be frustrating and difficult to pursue (Kantor, 1982). Research has shown that the biggest barriers to intrapreneurship are not a lack of resources, but it is the organizational culture (Eesley and Longenecker, 2006). Namely, the top barriers to intrapreneurship do not refer to financial or time resources restrictions but to a lack of support and systematic encouragement for intrapreneurship to happen. Eesley and Longenecker (2006) identified the top perceived barriers to intrapreneurship, and proposed gateways to overcome those barriers. They are available in the table below.

Table 2.4 Summarizing the Ten Identified Barriers to Intrapreneurship (Eesley and Longenecker, 2006, 22)

Ten Barriers to Intrapreneurship,
Punishing risk taking, new ideas, and mistakes
Ideas with nowhere to go for follow-up or action
Failing to sanction, promote, and encourage intrapreneurship
Unhealthy politics: infighting and lack of cooperation
Poor communications and organizational silos
People not encouraged to think about opportunities
Unclear organizational mission, priorities, and objectives
Lack of real management support
Improvement and risk taking activity not rewarded
Inadequate time or resources

The notion that most of the barriers come from the organizational culture, the poor communication and silos between different organizational and departments explains the discrepancy and conflict between organizational and individual intrapreneurship within a same company. Menzel (2007) explains that due to the different views between the intrapreneurs and resource allocators, the intrapreneurs often don't get the required support to pursue the innovations. Consequently, intrapreneurship becomes a marginalized activity, and not part of the organizational core (Menzel, 2007). Menzel (2007) further summarized the underlying conflict of intrapreneurship within an existing organization, this illustrated in Figure 2.4

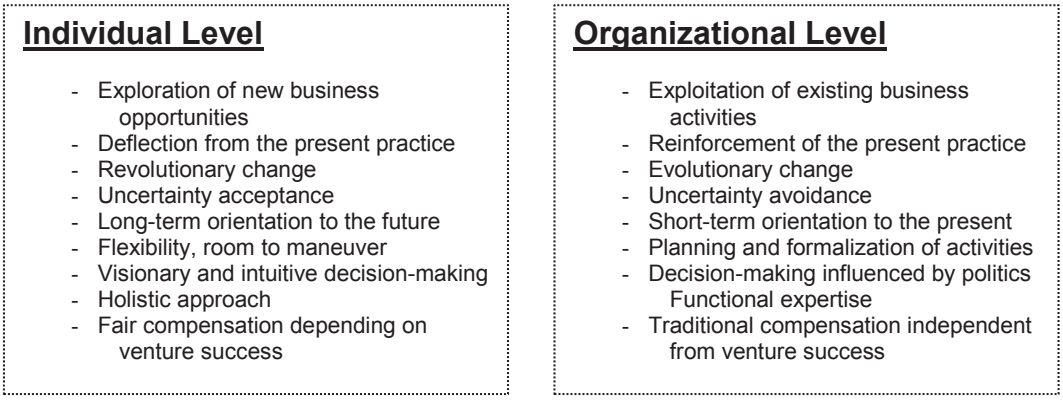


Figure 2.4 *The Underlying Conflict of Intrapreneurship: The Individual vs. The Organizational Level (Menzel, 2007, 25)*

2.2.4. Beyond Traditional Intrapreneurship – The Concept of Co-intrapreneurship

The research in the field of intrapreneurship can be categorized in three areas: the individual intrapreneur (Pinchot, 1985), the new corporate ventures formation (Krueger and Brazeal, 1994) and entrepreneurial organizations (Pinchot, 1985) (Antoncic and Hisrich, 2003). Our research focuses on the last 'entrepreneurial organizations' that start by stimulating individual intrapreneurs, and go beyond in supporting co-intrapreneurship and culture of risk taking and innovation (Thornberry, 2001) in order to create an culture where innovation can flourish (Shapiro, 2002).

Wunderer (2001) goes beyond the conventional approach of 'intrapreneurship' (Pinchot, 1985) and introduces the concept for 'co- (operative) intrapreneurship'. Co-intrapreneurship is based on 'organization-internal competition with a long-term, win-win-oriented co-operation' (Wunderer, 2001, 194). The concept of co-operative intrapreneurship can be linked with the nature of the 5th generation of integrated innovation process as defined by Rothwell (1994). Rothwell emphasized the importance of integrating different departments and enhancing the communication when working on new innovation projects (McFadzean, O'Loughlin and Shaw, 2005). Recent research in the field (Toledano, Urbano, and Bernadich, 2010) introduced the concept of collaborative entrepreneurship especially among employees, owners and groups who share information. It refers to the relationships between individuals within organization and plays an important role in stimulating innovations and

enhancing the competitive advantage of the company (Toledano, Urbano, and Bernadich, 2010). The difference between collective entrepreneurship and entrepreneurship is the notion that usually entrepreneurship celebrates the entrepreneur like a hero, whereas collaborative entrepreneurship connects several individuals with similar ideas and 'cognitive frames' (Berger and Luckmann, 1967) to pursue the innovation. This is especially important in big organizations and is of specific importance in contexts where engineers work. Engineers are a driving force for innovation (Fayolle et al., 2005). However, since innovation requires a multidisciplinary approach, in order to transform a technical solution into an actual innovation that serves the market, it requires engineers to be able to cooperate with employees from other departments such as marketing, research and development as well as external suppliers and service providers. This is addressed by the sense making framework by Dougherty (1992), who elaborates on the impact that the different worldviews that technical and administrative employees have on the innovation process, and how that explains why many good ideas that come from the technical department never come to attention from management (Soken and Barnes, 2008) and errors in the innovation process occur (Bernstein and Singh, 2008).
Moreover, this is further supported because in today's market conditions, for the innovations to be meaningful and succeed in the market, they require 'not only require unique technical knowledge but also social knowledge' (Menzel, Aaltio, and Ulijn, 2007).

There are different approaches in terms of who takes over the entrepreneurial behaviors and role within the company. One approach is when every employee is empowered to act like an entrepreneur (Thornberry, 2001). In this case, the employees don't have to be officially assigned the role of leaders. Anyone with entrepreneurial aspirations, at different levels of the organization takes over the role of an intrapreneur (Menzel, Aaltio, and Ulijn, 2007). Recent research talks about engineers and the importance of them acting like intrapreneurs, for the innovation performance of the company (Menzel, Aaltio, and Ulijn, 2007). Another approach, which is more typical, is when managers are trained to act as corporate entrepreneurs, and they 'identify and develop spin-ups (innovations in current businesses that can lead to substantial growth opportunities) or to create an environment where more innovation and entrepreneurial behavior is evidenced.' (Thornberry, 2001, 528).

3. Research Methods

3.1 Overview of Research Process

This section gives an overview of the research design and methods that were used to investigate how IA influence DC. For the purposes of this study, qualitative exploratory research was used, as it is believed to be adequate for complex research problems. It gave a fair amount of flexibility and new data that was acquired during the process was utilized to make the overall understanding of the problem clearer (Ghauri and Gronhaug, 2010).

The primary research method that was used was centered on a company in the form of a single embedded case study, and this method helped to better address the complexity of the study. Communic8 is a global firm primarily based in Europe. For purposes of this study the name of the firm remained anonymous, and was referred to as Communic8.

Case research usually requires a qualitative and a field based construction (Ghauri and Gronhaug, 2010). Particularly in business cases it was important that the phenomenon, in this case the innovation process was best investigated in its natural setting. This is particularly useful as the concepts and variables are difficult to quantify if not carried out any other way (Ghauri and Gronhaug, 2010). It is important to note that if particular variables are removed from their context it will be difficult to fully comprehend the phenomenon under investigation. Case studies are also appropriate for incremental theory building or new areas of research.

Semi-structured interviews were carried out as a research technique within the single embedded case study with Communic8. Communic8 was trying to establish how they can make use of innovation agents to positively influence their innovation process.

3.1.1 The Theoretical Process

The process of this study was structured using Maxwell's (2005) research model which can be seen in Figure 3.1. It shows the iterative process that took place during this qualitative study and the link between the five components of the model. The five components are elaborated below:

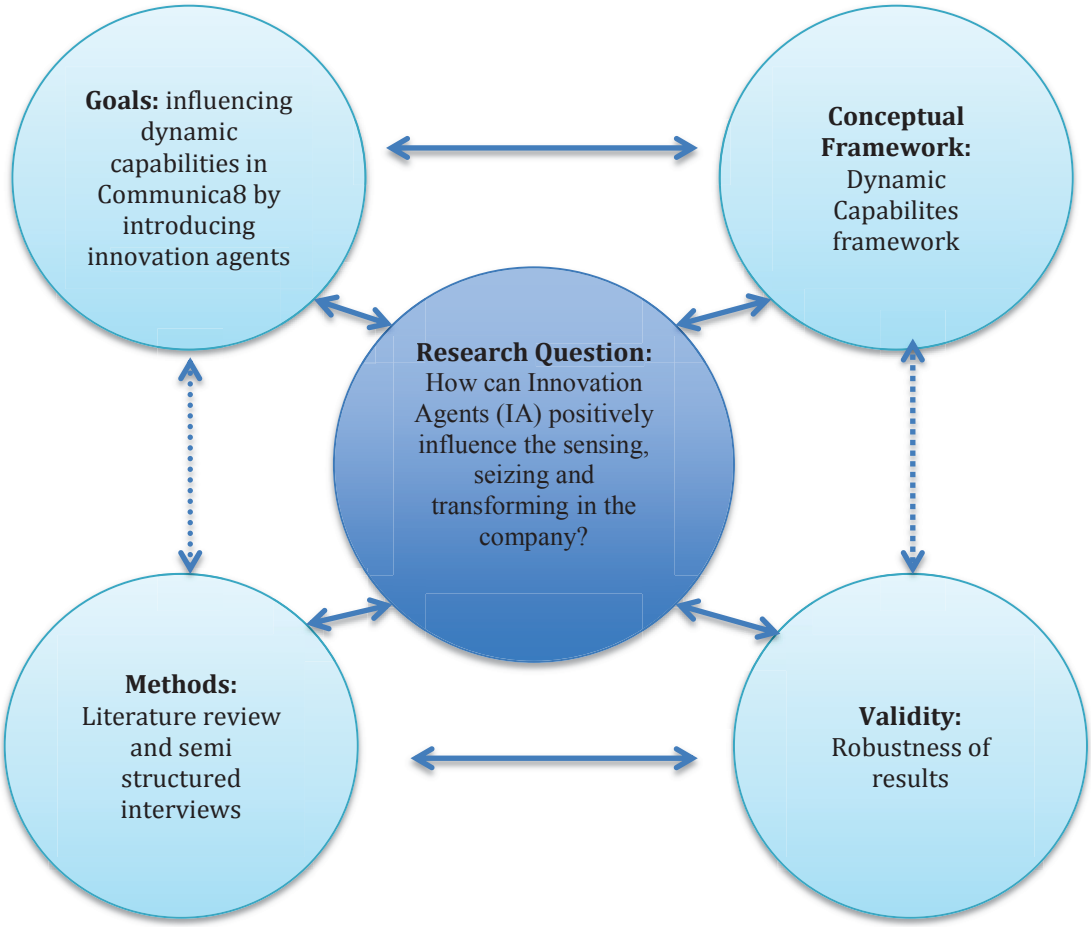


Figure 3.1 *Interaction Model for Research Design (modified from Maxwell 2005)*

Research Question: The research question was articulated after the problem discussion and formulation in section 1.3 and 1.4 to establish, how IA could positively influence the sensing, seizing and transforming within the innovation process. This question was the core of the study, since the objective was to establish how IA can align with and affect the DC in order to positively influence the innovation process.

Conceptual Model: This component of the iterative research model, we asked ourselves what we thought was going on or could be happening with the complex innovation process and its interaction with the external environment in the context of a conceptual model. The DC Framework was used as the conceptual framework and the lens throughout the research to demonstrate and understand what was happening in the context of our case

Methods: The methods component of this model gives an insight into the actual methods that were used during the study. These included a combination of qualitative methods: a single embedded case study, semi-structured interviews and literature review.

Goals: This component refers to what we aim to achieve during this study. The main goal was to establish how intrapreneurs can influence or maneuver DC in Communic8 in order to improve its innovation performance.

Validity: To ensure validity we applied the concept of triangulation. Triangulation is defined as 'the combination of methodologies in the study of the same phenomenon' (Jonsen and Jehn 2009, 125). We applied investigator triangulation:

Investigator Triangulation allowed the two researchers to be engaged in examining the situations and results, in order to 'ensure the credibility and consistency of the interpretation' (Jonsen and Jehn 2009, 139). We coded the data independently in order to eliminate the bias and then discussed and distilled our findings.

3.1.2 The Empirical Process

Below is an overview of the Research Process, which comprised of 3 phases: The first phase was the literature review process which gave us a contextualization of theory. Phase two was the exploration of our case study through semi structured interviews. Phase three was the data analysis and interpretation process. The data analysis phase also included some literature review on an innovation process of another global company.

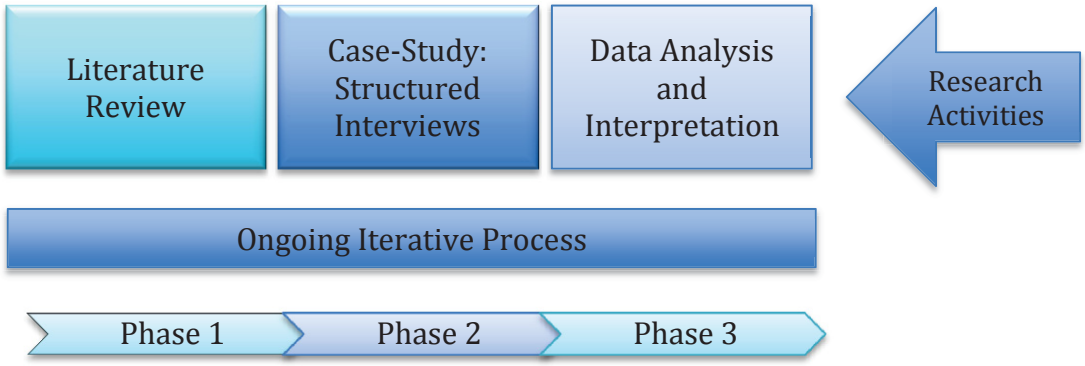


Figure 3.2 *The Research Process*

3.2 Research Population and Sample

The research sample for this study comprised of two Line managers, one Innovation and Research manager, one Business Unit manager and two innovators and/or engineers from Communic8. The Innovation managers were all the individuals involved in the innovation and research department. The innovators were the individuals or engineers who came up with an idea and/or developed an innovation during the different components of the innovation process or were involved with a successful or unsuccessful innovation within Communic8. A list of the sample group can be found in Appendix A.

3.3 Data Collection

The data collection process was carried out over two phases which comprised of conducting interviews and reviewing internal documents on the Innovation Value Chain and external sources on DC, innovation and intrapreneurship. The two methods are explained below:

3.3.1 Literature Review

The literature review was an iterative process that looked at a vast number of peer reviewed academic journals around the topic of the innovation process, dynamic capabilities and intrapreneurship in order to get a comprehensive understanding of these concepts. The literature review informed and shaped the theoretical framework of this research. However, during our literature review, it was identified that there was no established connection between dynamic capabilities and intrapreneurs, or innovation agents. In order to establish whether such a connection could positively influence the innovation performance we conducted an empirical study focused on the case company. The literature review also included an analysis of Shell's innovation process as an additional case of a big company that applied the concept of intrapreneurship in order to improve the innovation performance.

3.3.2 Semi Structured Interviews

Initially there were two exploratory interviews that were carried out with the Innovation and Research Manager. Thereafter, a total of six semi structured interviews were carried out during this study. In order to optimize the interview process the researchers familiarized themselves with the population sample's (respondents) background and roles within Communic8 (Ghauri and Gronhaug, 2010). Interviews had a flexible element and were carried out in person onsite at Communic8. We the researchers visited the company site and carried out interviews with the sample group. The interviews were conducted in person, with each averaging out to one hour in length. There were two separate sets of interview questions one for the engineers and one for the managers. That enabled us to get insights in the current state of the innovation process and dynamic capabilities from the perspective of engineer-innovators and the managers. The interview guides can be found in Appendix B.

In order to prepare for the interview process 1) the research problem was analyzed 2) as researchers we looked at what information was needed from the respondents to address the research question 3) finally based on the people within Communic8, we established who would best provide us with the relevant information. Eventually, a semi-structured and standard layout for the interview was established, which highlighted 'fixed response categories and systematic sampling and loading procedures' (Ghauri and Gronhaug, 2010, 126) and yet provided respondents freedom to discover findings that might not have been expected. In order to reduce any chances of misunderstandings or error during the interview process, the interviews were sent to the respondents beforehand. Secondly, during the process the interviews were recorded so that respondent's answers can be reviewed at a later stage. After the interviews were transcribed, this proceeded into the next stages of editing, data reduction, data display and verification which are explained in the following section.

3.4 Data Analysis

The Data analysis process started with data reduction where collected data was selected, focused and simplified through categorization and coding. The reduced data went through comparison, integration, and refutation (Ghauri and Gronhaug, 2010). The simplified and transformed data was displayed in a data matrix.

In order to have a systematic data analysis process the DC Framework was used to do a more comprehensive analysis.

The main objective of the analysis was to extract findings from the data collected during the research process. The data analysis was conducted in order to explore the relationship between the DC conceptual framework described in the section 2.1.3 and the intrapreneurial skills in section 2.2. By identifying the relationship it could highlight how intrapreneurial skills of an IA aligned with the DC of Communic8, could positively influence the Innovation Value Chain.

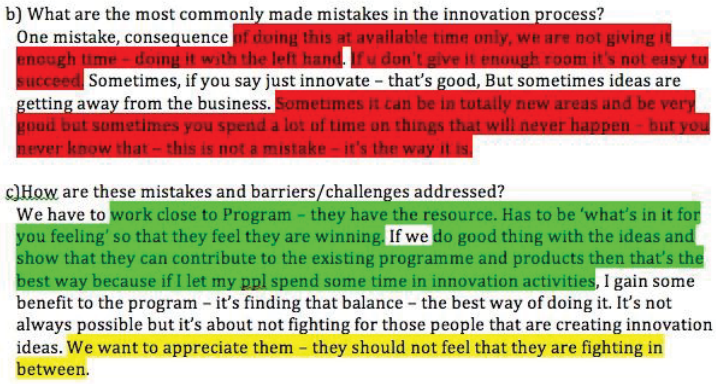
3.4.1 Our Qualitative Data Analysis Process

This section will explain the stages in our data analysis process. The transcribed interviews started from an editing process through to data verification.

1. **Editing:** This was done to ensure that the quality of the data was in order. It involved becoming familiar with and the inspection of all the data collected during the interviews. This process was necessary to minimize the possibility of conflicting or discrepant information being present in the data, which could affect the overall value (Ghauri and Gronhaug, 2010). This was done by carefully going through the interview transcripts. We discovered potential relevant points that required more clarification and/or an explanation. To address this, we conducted an additional follow-up phone interview with the Innovation and Research Manager, who provided the required data. This was mainly information regarding the evolution of the company innovation process that fuelled the history of the case section.
2. **Data reduction:** This process included the 'selecting, focusing, simplifying, and transformation' of the data collected from the semi-structured interviews (Ghauri and Gronhaug, 2010, 199). All the transcribed interviews were thoroughly revised, and relevant information was selected and extracted based on whether it answered the research questions that were within the research focus. We mainly focused on identifying the enablers, barriers and intrapreneurial skills that played a role in the Innovation Value Chain and aligned with the dynamic capabilities of the company (sensing, seizing, transforming). The iterative data reduction process included the following

analytical steps: categorization, coding, comparison, integration and refutation (Ghauri and Gronhaug, 2010, 204).

3. **Categorization and Coding:** This was our study's classification process, which was crucial for the data reduction process. First and foremost, we identified some categories in which responses could be placed. We started by organizing the responses in categories of enablers, barriers and intrapreneurial skills that related the DC framework components. We applied color coding by coding the enablers and barriers to the DC in green and red, and the intrapreneurial skills in yellow, as illustrated in Figure 3.3.


b) What are the most commonly made mistakes in the innovation process?
One mistake, consequence of doing this at available time only, we are not giving it enough time - doing it with the left hand. If u don't give it enough room it's not easy to succeed. Sometimes, if you say just innovate – that's good, But sometimes ideas are getting away from the business. Sometimes it can be in totally new areas and be very good but sometimes you spend a lot of time on things that will never happen - but you never know that – this is not a mistake – it's the way it is.

c)How are these mistakes and barriers/challenges addressed?
We have to work close to Program – they have the resource. Has to be 'what's in it for you feeling' so that they feel they are winning. If we do good thing with the ideas and show that they can contribute to the existing programme and products then that's the best way because if I let my ppl spend some time in innovation activities, I gain some benefit to the program – it's finding that balance – the best way of doing it. It's not always possible but it's about not fighting for those people that are creating innovation ideas. We want to appreciate them – they should not feel that they are fighting in between.

Figure 3.3 *Data color coding. The data was later assembled and displayed in a template coding sheet (see Figure 3.4)*

4. **Data display:** We organized the reduced and categorized information in a data matrix, which helped us identify the relation between the dynamic capabilities and the identified enablers and barriers to innovation as part of the Innovation Value Chain.
5. **Researcher triangulation:** The two researchers coded the data collected from the interviews independently, in order to ensure researcher triangulation and reduce bias in interpreting and categorizing the data. This resulted in two coded data matrices, each presenting the discovered enablers, barriers and intrapreneurial skills in the company Innovation Value Chain.

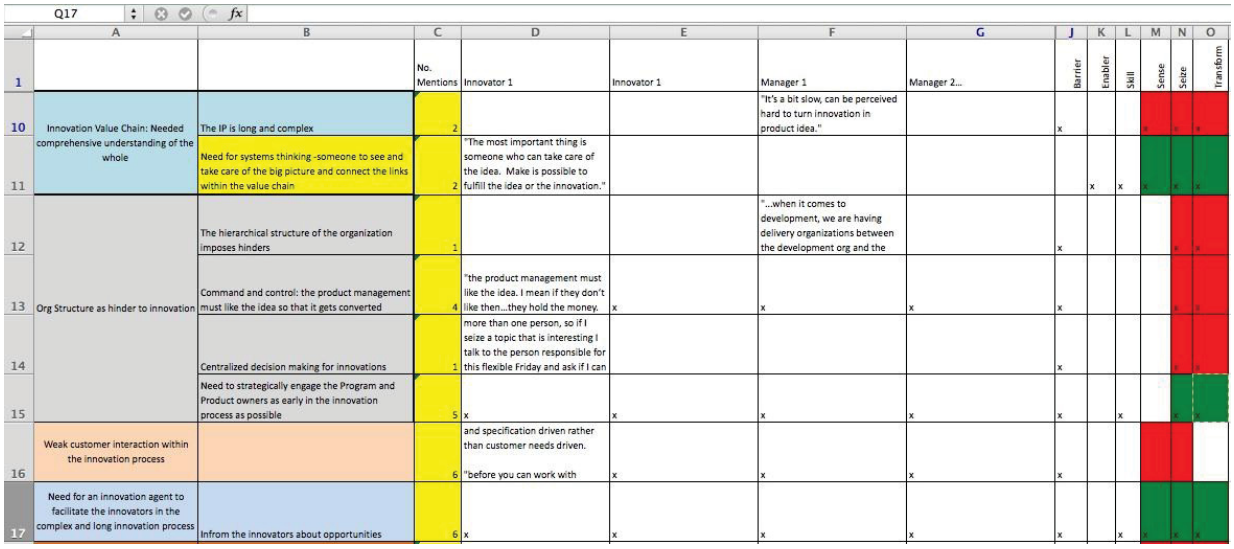
6. **Data integration:** The two matrices were merged in one joint matrix that combined the findings from the two researchers. The methods used to merge the results were discussion, comparison and knowledge integration.

The joint matrix organized and combined the identified factors: enablers, barriers and intrapreneurial skills in the Innovation Value Chain according to emerging themes. The organization under 'emerging themes' enabled us to combine the findings that were similar under same category. For example the following barriers: 'Prioritization: low priority on innovation, high on product and daily operations'; 'Low flexibility: difficult for people with ideas to get space to innovate'; 'Accent put on production line, not on innovation', 'Lack of research focus', were all combined under the theme 'Underlying conflict between the individual and organizational level', which is listed as one of the main barriers to intrapreneurship and innovation by Eesley and Longenecker (2006) and Menzel (2007).
A similar approach was applied to the other overlapping factors. This enabled us to organize the long list of findings into a shorter list of combined categories.

3.4.2 Mapping the Dynamic Capabilities

The next step involved mapping the identified barriers, enablers and intrapreneurial skills in the Innovation Value Chain in the DC they related to, sensing, seizing, and transforming. We used color coding to indicate whether there was a positive or negative influence on the specific dynamic capabilities area. The matrix and the color coding are illustrated in Table 3.4.

The enablers mainly highlighted roles that intrapreneurial minded managers play, and thus help enhance the sensing, seizing and transforming of opportunities. The barriers revealed areas where intervention was required in order to improve the DC performance.



	A	B	C	D	E	F	G	J	K	L	M	N	O
1			No. Mentions	Innovator 1	Innovator 1	Manager 1	Manager 2...	Barrier	Enabler	Skill	Sense	Seize	Transform
10	Innovation Value Chain: Needed comprehensive understanding of the whole	The IP is long and complex	2			"It's a bit slow, can be perceived hard to turn innovation in product idea."		x					
11		Need for systems thinking -someone to see and take care of the big picture and connect the links within the value chain	2	"The most important thing is someone who can take care of the idea. Make is possible to fulfill the idea or the innovation."					x	x	x	x	x
12	Org Structure as hinder to innovation	The hierarchical structure of the organization imposes hinders	1			"...when it comes to development, we are having delivery organizations between the development org and the		x				x	x
13		Command and control: the product management must like the idea so that it gets converted	4	"the product management must like the idea. I mean if they don't like then...they hold the money.	x	x	x	x				x	x
14		Centralized decision making for innovations	1	more than one person, so if I seize a topic that is interesting I talk to the person responsible for this flexible Friday and ask if I can				x				x	x
15		Need to strategically engage the Program and Product owners as early in the innovation process as possible	5	x	x	x	x	x		x			
16	Weak customer interaction within the innovation process		6	and specification driven rather than customer needs driven. "before you can work with	x	x	x	x					
17	Need for an innovation agent to facilitate the innovators in the complex and long innovation process	Infrom the innovators about opportunities	6	x	x	x	x	x		x	x	x	x

Figure 3.4 *An Extract from the Data Matrix Illustrating the Data Reduction Process*

Conclusion drawing and/verification: Patterns were evident in the data, revealing the enablers in the Innovation Value Chain. The patterns also began to indicate the positive influence in the sensing, seizing and transforming processes.

3.5 Methodological Limitations

There were some limitations to the research methods that were selected. Due to time and administrative restrictions the sample for the interviews was small, which limited us from extracting widely applicable empirical findings. In addition, the interviews were recorded in order to make the transcribing process easier. There is the threat that the respondents may not be comfortable with having the call recorded and we would only have the opportunity to note down the important aspects only. There is a high risk of misinterpretation and error. Another limitation with interviews is the quality of the data relied on the questions asked. If the wrong questions were asked, the validity of the study can be compromised. The responses of the sample group may also not be at the required depth. The presence of the researchers may have affected the responses of the participant as they could feel uncomfortable.

3.6 Expected Results

Building on research about the role of intrapreneurs play in firms and the importance of the role that DC play in enhancing a company's innovation performance and competitive advantage, we hope to establish a connection between intrapreneurship and DC.

The expected outcome of the research is to give an indication of what role and/or to what extent the introduction of innovation agents that play the role of intrapreneurs can positively influence the dynamic capabilities within the innovation process of Communic8. Ultimately, this would lead to an overall improvement of the innovation performance of the firm. The results collected from interviews should support the data collected from the literature review. We are expecting that IA with intrapreneurial skills will strengthen and have a positive influence on the innovation performance of Communic8.

We also expect to extract the enabling factors necessary to ensure that successful innovation takes place. The barriers, challenges and mistakes that were experienced in the past innovation projects to be acknowledged, so that they are avoided or addressed appropriately in the future when intrapreneurs become a part of the process.

4. Case Description

4.1 Overview of Communic8

Communic8 is a global company spread across nine regions including North America; Latin America; the Mediterranean; Western and Central Europe; Northern Europe and Central Asia; the Middle East; Sub-Saharan Africa; India; South East Asia and Oceania; and finally China and North East Asia. It is one of the leading companies in the industry, providing equipment and services to users all around the globe (Communic8 website, 2012). The global services that Communic8 provides to its customers include delivery, upgrades and support. The company portfolio includes a variety of components for its customers (Communic8, 2012). In 2011 it achieved net sales recorded at almost USD 8 billion and operating income recorded almost USD 2 billion. Currently, it employs approximately over 100 000 people worldwide (Communic8 website, 2012).

Communic8's reach spans across 180 countries, in which a significant amount of the world has access to its products and services. It aims to provide services around the world that are more effective and efficient through its solutions. Communic8 has made a significant contribution to the overall communication evolution by using mainly innovation technology and sustainable business solutions (Communic8, 2012). Its innovation approach has helped empower not only people, but businesses and society by working towards a networked society. The company's innovation approach is reflected in the eight components of its vision, which are listed in Appendix C.

4.2 The TUC Division

As illustrated in Figure 4.1, the regions are not the only components of the company structure. There are eight group functions and four business units. The TUC business unit (this is the renamed version in order for the firm to remain anonymous) of Communic8 comprises of nine sites around the globe. However, for purposes of this study, the Scandinavian site will be the specific scope. As illustrated in Figure 4.1, the TUC business unit like the other business units is aligned with the research division. The TUC Research & Development engages in system and technical product

management; in-house design and test; and integration, verification and maintenance. The objective of the TUC Business Unit is to establish solutions that simplify the process to use a variety of services. Networking and collaboration services are a couple examples of communication solutions that the BU provides to its customers.

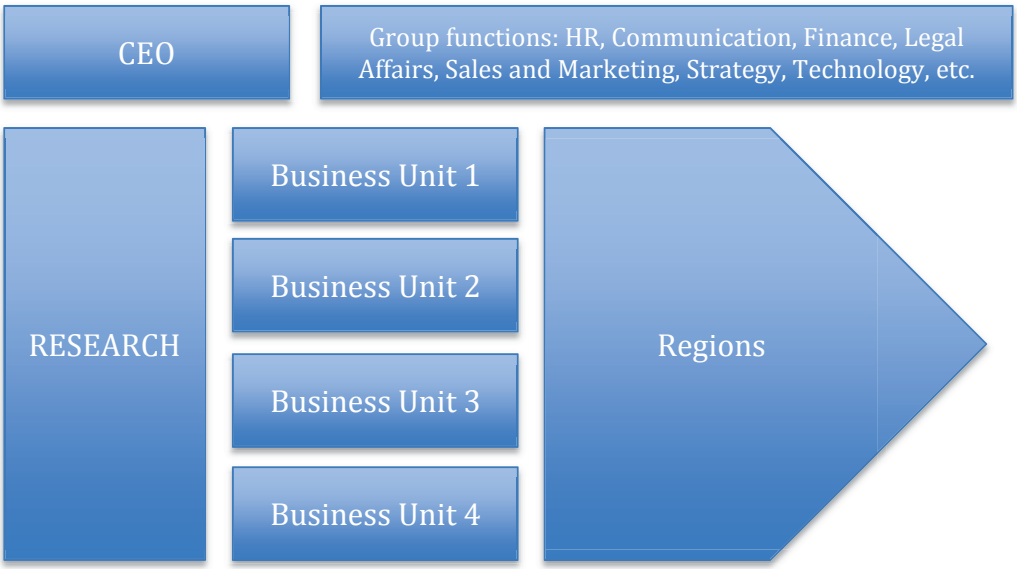


Figure 4.1 *Overview of Communic8's Structure*

The three decade old site of Communic8 is a software unit that is exploring and developing new sustainable and world leading technologies and solutions (Communic8, 2012). Communic8's site facilitates and supports approximately few hundred telecommunications operators globally with over one billion end users. State of the art testing environments are also part of the site (Communic8, 2012).

4.3 The Innovation Value Chain of Communic8

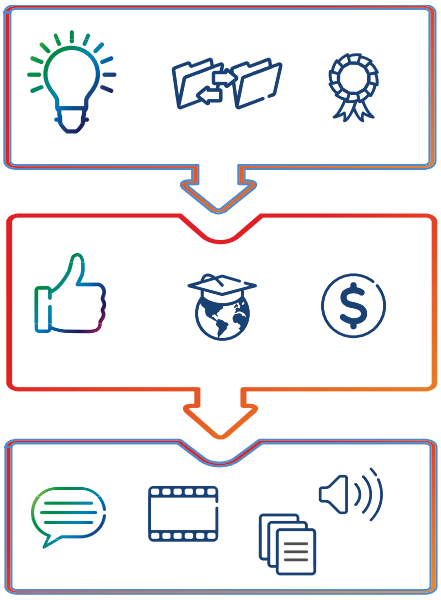
The company started putting focus on the importance of innovation more intensively over the last 10 years (Respondent3, 2012). The introduction of incentives to stimulate innovation such as innovation competitions and the role of an Innovation and Research Manager are part of the increased efforts to support innovation.

The company innovation focus gravitates around the strategic product areas. Put differently, the company's screening and funding emphasis is set on innovations that

are within the company strategic focus and existing product areas. This contributes to mainly supporting incremental innovations. The sensing of innovation opportunities is encouraged mainly within the focus areas dictated by the company strategy. Yearly, they have several focus areas, which are reflected in the competition topics and for opportunities sensed outside those areas it is very difficult to get funding and possibility to seize and transform without the Strategic Product and Program Manager permission (Respondent1, Respondent2, Respondent4, Respondent5, Respondent6, 2012).

The Innovation Value Chain presents innovation as a sequential, three-phase process that involves idea generation, idea conversion, and idea deployment (Birkinshaw and Hansen, 2007). The Innovation Value Chain is illustrated below.

Figure 4.2 *Communic8's Innovation Value Chain*



Idea Generation: This phase of the process involves sensing opportunities through collaboration within departments, across departments and outside the company. Examples of idea generation activities include Flexible Fridays and Innovation Competitions.

Idea Conversion: This phase of the process involves seizing opportunities through screening, funding and prototyping. Examples of idea conversion activities include jam sessions and user stories.

Idea Deployment: This phase of the process involves transforming opportunities in innovations by diffusing the ideas within the company and outside on the market: through demos and lobbying

4.3.1 Innovation Incentivizing Activities

Currently, the company has a high competency, especially in the idea generation phase. It has been reported that there are many good ideas generated (Respondent1,

Respondent2, and Respondent3, 2012). In addition, the company invests in additional mechanisms to stimulate the employees to contribute with ideas. Some of the efforts and activities are presented by year starting 2009 include the following:

2009: Flexible Friday

This initiative was inspired by the Google Flexible Friday (Respondent5, 2012). It was first introduced in one department, where it received support from the Line Manager. After the initial success the initiative was open for employees from all departments.

The 'Flexible Fridays' offers space for each employee to work on a project/activities he/she has chosen from a list of sanctioned activities. The main objectives of this initiative are to encourage employees to have more fun at work, share competences and collaborate between teams and projects in order to generate innovation and technical enhancements in current and future projects. Moreover, the Flexible Fridays provide an opportunity for engineer-innovators to become visible, stand out and present their ideas. There is a certain administrative procedure that is required before an employee gets the space to work on Flexible Friday. That involves scheduling the work in advance and getting agreement with the Line Manager and the Program Manager (Communic8 presentation, 2012). Although, employees are given the freedom to choose a Friday and dedicate to developing their innovation, in the Flexible Friday description it is noted that meeting the targets and delivering projects: on time and budget, with committed functionality. Therefore, this implicitly restricts the freedom of choosing a Flexible Friday depending on the workload, other project and daily work priorities (Respondent1, 2012).

Currently, on average only 5% of the employees use the Flexible Friday (Respondent5, 2012). However, the real contribution of the initiative is to showcase that the company provides opportunities and support for innovation, which contributes positively to the overall innovation climate. The outcome of the Flexible Friday is 23 ideas that came from there and were deployed (Respondent6, 2012). Mainly these are incremental innovations, because the nature of the initiative is to support ideas that are narrowed down to innovations that can be converted into prototypes within one Flexible Friday, or 24 hours of work.

2010: The Introduction of the Innovation and Research Manager Role

The role of Research and Innovation Program Manager at the local site was assigned in 2010. The manager is responsible for all the different activities around innovations, which includes facilitating the innovation process throughout all stages of the innovation process. The main responsibility is to ensure engineer-innovators within the company are made aware of opportunities and supported throughout all stages in the innovation process, from idea generation to the idea deployment stage. In addition to facilitating the innovation process, the manager is involved in the research activities, initiating and managing collaboration projects with universities, institutes and other research departments on other sites. The manager collaborates closely with Line Managers, and is often in the field talking to engineer-innovators and people with ideas in order to make sure they have the right information for best ways to seize and deploy the ideas. The Innovation and Research Manager has also initiated a number of innovation process activities that aim to stimulate innovation and improve the innovation climate within the company. Examples of these activities include the Innovation and Research newsletter and the Innovation Pub.

2010: Introduction of the local yearly Innovation event Innovation Competitions.

The Global Innovation competition for all company units started in 2006. Since then, the TUC Unit we are looking at for this study has qualified to the final every year. The last two years, the unit has won the finals twice. The yearly Innovation Challenge is one of the most prominent innovation activities, which opens opportunities for the engineer-innovators to present their ideas, seize the opportunities and transform them into innovations. The competition focus shapes the sensing of opportunities. Each year is dedicated on a specific area of interest that is in accordance with Communic8's strategy. The sensing and idea generation happens in the first half of the year. The competition closes for submission of ideas in June. The selected finalists continue in the next stage of seizing the ideas and converting them into prototypes and demos. Along with that process, they work on refining the technical and business arguments of the ideas. At the end of the year, the finalists present the solutions within the company and to the customers. One winner or winning team is selected per strategic category, and receives a financial award for deploying the prototype into innovation.

2011: Introduction of the Bi-monthly Innovation and Research Newsletter

Another effort to provide visibility to the innovation activities is the Innovation and Research Newsletter. It is released twice a year and is distributed via the Company Information Center. The newsletter plays an important role in recognizing the engineer-innovators, and diffusing the ideas and innovations throughout the site.

2011: Introduction of the Innovation Bar

The Innovation Bar is a bi-monthly event aimed to support networking between employees from different departments, by bringing them together in an informal and relaxed context. It takes place after work hours and its main purpose it to get conversations around innovation going between people that may not be collaborating on regular basis, because of the departmental division and organizational structure.

The innovation performance of Communic8 is measured through the *Innovation Index*, which is reported on yearly basis, and is a based on the performance in the following areas: the number of patents issued the innovation climate, customer and user insights, personal commitment of the employees and supporting innovation processes.

5. Analysis

The following chapter presents the data organized in two sections:

1. The barriers identified in the Innovation Value Chain organized by themes that come from the barriers to intrapreneurship. These are categorized under hurdles that impact the sensing, seizing and transforming of ideas into innovations.
2. The intrapreneurial skills and the influence they have on addressing the barriers and leveraging the potential in sensing, seizing and transforming of ideas into innovations.

5.1 Barriers in The Innovation Value Chain based on the Barriers to Intrapreneurship

Two engineer-innovators and four managers within Communic8 were asked to identify the enablers and barriers they have faced in the innovation process for:

i) a successful innovation: an idea that went through the whole Innovation Value Chain and was deployed on the market;

ii) an unsuccessful innovation: an idea that did not get deployed.

The identified barriers were organized according to the themes of barriers to intrapreneurship identified by Eesley and Longenecker (2006) and the conflict of intrapreneurship: the individual vs. the organizational level (Menzel, 2007). We used the DC framework proposed by Teece (2007) to categorize the findings under sensing, seizing, transforming (See Figure 2.1 *Foundations of the Dynamic Capability Framework*).

5.1.1 Identified Barriers That Affect The Sensing of Ideas in Innovations

1. Low priority given on innovation, high priority set on daily product operations caused by the underlying conflict between the individual and organizational level

Despite the efforts of the company to place innovation at the core of its functioning, all respondents shared the opinion that innovation is given a relatively low priority compared to the production and day-to-day operations. Still the traditional product based approach and pressure to meet customer demand on time within the imposed budget and quality requirements forces employees to place innovation as a secondary choice and focus on daily work. This impedes the innovation process and discourages intrapreneurship behavior.

> *'...It is always like that, innovation has lowest priority so when we come to a deadline we must deliver and leave innovation for later, postpone it.'* – Respondent1, 2012

> *'... doing innovation at available time only, we are not giving it enough time – we are doing innovation with the 'left' hand'* – Respondent5, 2012

The evidence highlights that innovation is considered as a secondary choice although there are many efforts initiated to stimulate employees to come up with new ideas (for example Competitions, Innovation Pub), results in having many opportunities sensed and new ideas generated (Respondent1, 2012). That makes Communic8 an 'ideas rich' company. However, many ideas do not get further developed and often only end in the ideas database, or diminish 'in a part of the organization that's too busy doing other things or that fails to see their potential' (Birkinshaw and Hansen, 2007). This is a consequence of the information discrepancy between what the intrapreneurs and the resource allocators know about the emerging innovation (see Menzel, 2007). Intrapreneurs usually know more about the potential to exploit the opportunity they have sensed and require greater autonomy than the company and the existing organizational structure could offer them. Consequently intrapreneurs and innovation are marginalized and not part of the organizational core.

2. Weak focus on processes to direct internal R&D to new areas and select new technologies

2.a Revolutionary Change versus Evolutionary Change: Focus on Incremental Innovations only

> '*That's the trick. As long as you do incremental steps, it's quite ok because you can make a formal requirement related to product and you can try to motivate that this requirement is good for that. But if we try to do innovation that takes us to a new area, that's very difficult.'* – Respondent2, 2012

> '*If the ideas are not in the strategic area it's quite hard to take the next step and go to the strategic product manager and because then the risk is that it won't continue.'* – Respondent1, 2012

All respondents reported that innovations are supported only when they are incremental improvements of the product functionalities, which are within the strategic focus of the company. It often happens that due to the short term view the part of the organization responsible for providing funding for seizing and transforming ideas into innovations, often fails to see the long term potential of ideas that might seem outside the strategic focus at that specific time. That's not challenge that's specific for Communic8 – many companies are facing similar challenges. An example from the literature is the General Electric (GE) attempt to innovate within the area of growing demand for energy efficient lighting, consumer appliances, and heating systems (Birkinshaw and Hansen, 2007). To respond to the sensed opportunity, General Electric invested in an energy management services business in Canada in the 1990s. Although the business demonstrated early success, it wasn't the right fit for the GE product focus at that time. The business innovation was shut down, after few years of struggle to survive within the different focus of GE. As a consequence, 'GE missed an opportunity to gain early-mover advantage in a growing industry' (Birkinshaw and Hansen, 2007, 125).

2.b. Innovation Mindset: Engineer-Innovators are Path Dependent

Most of the engineers have a long history of experience in working for the company (Respondent1, 2012). The specific site that is being looked at for the purpose of the research has a history of being focused on production and delivering orders. This has shaped the mindset of employees and contributed to risk aversion, competency and routinization traps within the proven technological areas.

> *'Once again we are streamlined to do that (production) very good but then we are becoming good at taking the requirements, developing, and delivering them on time and we are no longer getting good at seeing if customers have this kind of solution that we are developing now and complementing it. That's a problem.'* – Respondent2, 2012

The path dependency and the strong technological drive sometimes result in missing to see the business opportunity behind the technical solution. The engineers reported that they sometimes face problems in setting the scope of the technical possibilities, and forget to explore whether there is a demand on the market for the particular technology (Respondent1, Respondent2, 2012).

3. Need for Further Development of Processes to Tap Development in Exogenous Science and Technology, Tap Supplier, Complementor and Customer Innovation and Integrate Know-How from the Outside

3.a Limited interaction with customers

All respondents agreed that customer interaction is a primary driver for innovation and expressed the need for more frequent interaction with customers, in order to convert the technology push innovation to customer driven solutions. However, the organizational structure and hierarchy often imposes administrative difficulties in managing the close collaboration with customers, mainly because there are intermediaries between the company and the end users.

> '*That's the gap we should work on, closer collaboration with customers. As a development organization we have a gap here… We can also join on customer*

meetings from development perspective to better understand the needs. It's an administrative issue and it can be overcome. '- Respondent5, 2012

3.b. Silos Exist Between Different Departments and Units

The size and structure of the organization resulted in limited collaboration between different departments within the same site.

'*We are trying to bridge the communication between the different areas. Even within Communic8, we don't know what the neighbor in the other room does. So, the communication is not really good in that perspective.* ' – Respondent6, 2012

We identified limited utility of the cooperation and teamwork between employees. This can serve as an inhibitor to innovation and intrapreneurship. Intrapreneurship is enhanced under conditions when employees are encouraged and trained to work together and share ideas (Eesley and Longenecker, 2006). The participation of more employees with a diverse set of skills, rather than relying on few individuals with engineering and technical background could contribute to more effective problem solving and enhanced intrapreneurship practices (Eesley and Longenecker, 2006). In addition, the collaboration fuels the co-specialization, which allows the company to utilize the resources available and reconfigure them in new assets combinations (Teece, 2007). This is made possible through asset combinations, and is especially valuable strategy when the asset owners are not familiar with assets available at the other departments/units/sites and miss to see the potential to enhance the value through combing those complementary assets. This often happens due to organizational silos, lack of cooperation, and the lack of ability of the management to see the opportunities to identify, develop, and utilize the combination of available specialized and cospecialized assets (Teece, 2007).

3.c. Collaboration with Universities and External Collaborators

Respondents reported about the need for more intensive collaboration with universities and external collaborators. Collaborating with universities is an interaction where the company develops selected ideas into prototypes with the assistance of the students as part of their student projects. This was reported as a

major enabler in seizing of innovation opportunities and making prototypes that got further deployed. However, the respondents reported that establishing and sustaining such cooperation could be a time intensive activity. Given the time pressure that daily production operations impose, dedicating time to fostering this collaboration is often not the priority, despite the reported benefits it brings to the innovation.

5.1.2 Identified Barriers that Affect the Seizing of Ideas in Innovations

1. Centralized Decision-making Protocols and Enterprise Boundaries to Manage Complements and Control Platforms

1.a. Limited flexibility for employees and room to maneuver to work on innovation projects;

> *'A person that works in Communic8 is fully booked from a program point of view. It's hard for them to find room to work with the innovative ideas'* - Respondent6, 2012

Despite the efforts to give engineer-innovators space to focus on developing their ideas in the form of Flexible Fridays or competitions, the flexibility remains relatively low due to the organizational hierarchy and bureaucratic working culture. To use a Flexible Friday, engineer-innovators need to plan 14 days ahead and get permission from the Line Manager and the team they are working with (Respondent1, 2012). Given that often there is high pressure to meet the product deadlines, it can be difficult to get the time to work on developing the innovations.

> '*…Time (is the biggest barrier to innovation) because it's planned in the program they (the* engineer-innovators*) belong to – and if they want to put time in other aspects that are not in project manager's interest it's sometimes hard to find the time*' – Respondent5, 2012

Due to the lack of time, and the inadequate screening and funding processes the situation is diagnosed as one where 'concepts rarely flourish, nor do they die' (Birkinshaw and Hansen, 2007, 122). It happens that even ideas that were selected as winning concepts in the competitions do not get further developed (Respondent4, 2012).

To address the lack of time, engineer-innovators try to get support from the Line Managers in order to get space to work on innovation. This often results in engineer-innovators dedicating hidden man-hours or working on innovation after work. Some of the innovation activities themselves, such as the Innovation Pub, take place after work hours. This results in many employees not being able to attend it, since it's not embedded in the daily work hours. On the one hand, the notion that employees are eager to dedicate hidden man hours and attend after work innovation events speaks about the motivation of the employees to innovate. On the other hand, there is risk of the talent within to leave the company if they see that the company doesn't provide space for them to innovate and grow (Respondent3, Respondent4, 2012).

> *'... (We need) awareness from the company management that if we don't allow the innovation to happen here it will happen somewhere else. And that is a risk if we want to be on top of it. Innovation happens here and also happens in competitors companies... Also, the people who are innovative here are actually looking at leaving the company for another company where they know that innovation is considered important.' - Respondent4, 2012*

2. Need for better 'Fit' with the strategy, structure and processes of the company: Unclear shared organizational mission, priorities, and objectives for successful innovation

This is connected with the lack of shared vision of success for what a 'winning' innovation concept looks like. Respondents revealed that there were divided opinions on the topic of what 'success' of an innovative idea means (Respondent1, Respondent2, Respondent4, 2012). Innovators that generate ideas relate success with coming up with an idea that is visionary, creating a prototype, and having the management like the idea (Respondent1, Respondent2, Respondent4, 2012). The

managers define successful innovations as those that respond to the customer needs and are within the strategic innovation focus of the Communic8 (Respondent3, Respondent5, 2012). This revealed discrepancy in the way different parts of the organization define success.

The cause for this has been traced to the lack of a designated role for someone to see the holistic picture and the links between the different elements of the Innovation Value Chain, and the company, as a whole and to be able to engage the Product and Program Managers in the innovation process during the early stages, so that the sensing and seizing of opportunities is framed within the strategic focus (Respondent3, Respondent6, 2012).

5.1.3 Identified Barriers that Affect the Transforming of Ideas in Innovations

1. **Weak innovation governance: Conflict between the long term orientation to the future and visionary and intuitive decision making and the short term orientation to the present and decision making influenced by organizational politics and policies**

The conflict between the short-term views focused on daily operations by the Product/Program managers and the long-term views for more visionary innovations by the innovators results in conflict between the two sides. The short-term views impose risk for overseeing some innovation opportunities, which are not part of the direct strategic focus of the company, but could be of potential importance for the long term development of the organization (Respondent2, Respondent4, Respondent6, 2012). The short-term view of seeing the benefits within innovative ideas is reported as a common problem, that's limiting the innovation potential of the visionary oriented employees.

> *'The most common problem is that each and everyone looks at the short term aspect and you have to make the investment and say - I will make a day here and I'll make money tomorrow'* - Respondent6, 2012

2. Centralization - Command and Control Culture: the Program and Product Managers have the Last Word in Decision Making

The organizational structure, mindset and hierarchy have been reported as one of the biggest barriers to innovation. When asked what a successful innovation is, engineer-innovators usually associate the successful ideas with ideas that 'the management is going to like' (Respondent1g, Respondent5, Respondent2, 2012). This sets a climate of centralized decision-making, a risk-averse and bureaucratic culture. The holders of the funds have the power to decide which ideas would be deployed. Birkinshaw and Hansen (2007, 127) described the difficulty of converting the ideas with the following quote from a company manager 'If I want to get a new idea to market quickly, I take personal control of it, and I steer it through the system. If I want to kill an idea, I send it through the formal process.'

All respondents reported that the final decision for whether an idea is going to be converted and deployed is completely dependent on the decision of the Program and Product Managers. The management 'buy in' early in the process can be both the greatest obstacle and the greatest enabler for innovation (Respondent1, Respondent2, Respondent4, Respondent5, 2012). Yet, in a technology firm many of the engineer-innovators are lacking the skills to present their ideas in an appealing way that would bring the 'buy in'. That contributes to good ideas being dismissed due to the lack of proper presentation (Respondent1, Respondent2 2012).

3. Lack of Holistic Approach to and Understanding for the Innovation Value Chain

In his research Menzel (2007) underscored the importance of having a holistic description to intrapreneurship-conductive culture. The case study also confirmed that the over-arching challenge is to understand the Innovation Value Chain as a whole and to acknowledge the different challenges and stakeholders at each stage. To achieve this, the respondents uncovered the need to assign a separate role of a person responsible for 'taking care of the ideas' throughout the whole value chain (Respondent1, 2012)

'*The challenges are not: the number of ideas, the quality of the idea, the funding and resources…The Challenges are: how to keep focus on the Value Chain (Generation - Conversion - Deployment*) as a whole' – Respondent3, 2012

The respondents described the Innovation Value Chain as a complex, long and demanding process (Respondent2, Respondent5, Respondent6, 2012). Their concerns revealed that converting and deploying an idea into actual innovation is not an easy process.

Engineer-innovators motivation to innovate and sense opportunities is negatively affected because they are mindful of the complexity of the innovation process, and the difficulties to succeed in seizing and transforming of the opportunities (Respondent2, 2012) especially under conditions when innovation is given a lower priority compared to the daily operations. To address this, the respondents emphasized the need for management support and for having an internal Innovation Agent whose role is to ensure that the innovators received the required support throughout the innovation process.

5.2 The Intrapreneurial Influence on Addressing the Barriers and Leveraging the Enablers in Dynamic Capabilities

To address the barriers mentioned in section 5.1, and utilize the enablers in the DC we identified during our research the positive influence that the Intrapreneur skills have in the DC framework.

5.2.1 Identified Positive Influence on the Sensing of Opportunities

1. Supporting the Further Development of Processes to Tap Development in Exogenous Science and Technology, Tap Supplier, Complementor and Customer Innovation and Integrate Know-How from the Outside Through:

a) Customer Interaction

All of the respondents reported that customer interaction is the best source for innovation and sensing right opportunities. However, due to the organizational size and structure, usually there are intermediary parties between the company and the customers, which makes direct customer interaction more difficult (Respondent3, Respondent5, 2012). In the light of addressing this challenge, the respondents reported on the positive effect that came from the Innovation and Research Manager and his intrapreneurial behavior and demonstrated skills for 'creative problem solving' by:

i) initiating customer simulations. This creative solution involves hiring people (usually from other departments) to act like customers with specific requirements that come from real customers. The simulation happens several times in the innovation process, usually every second week of an ongoing project. The purpose is to keep the engineer-innovators oriented to designing solutions that would fit the market needs (Respondent3, 2012);

ii) acting proactively and establishing connections with local companies, similar to the actual customer, and getting them to provide customers feedback (Respondent3, 2012);

This underscores the positive influence that the Innovation Manager has on the process of sensing the right opportunities and supporting the generation of ideas that respond to customer needs.

b) Direct the Internal R&D and Selection of New Technologies to Enable Sensing Opportunities within the Strategic Fit

All respondents stated that moving forward ideas, which are outside the strategic focus areas or the existing product line, is very difficult.

'*If the ideas are not in the strategic area it's quite hard to take the next step and go to the strategic product manager and because then the risk is that it won't continue.'* – Respondent1, 2012

Therefore, sensing opportunities within the strategic focus is of vast importance for the overall Innovation Value Chain. To frame the sensing within the strategic areas, the quality of the provided information about those strategic areas plays a vital role in making all engineer-innovators aware of the 'strategic sensing' focus. The

respondents reported about the benefits of the role that the Innovation Manager plays by organizing activities such as the Innovation pub and Innovation newsletter, where they could engage in dialogue and get informed about innovation opportunities, (Respondent1, Respondent2, Respondent5, Respondent6, 2012). In addition, the Innovation manager's positive influence was reported by taking on a role of 'Information provider', going 'on the field and finishing for ideas', and informing engineer-innovators about the upcoming opportunities in the form of competitions, where they could plan to present their ideas (Respondent1, 2012). All this contributes to the efforts of the Innovation Manager to align the engineer-innovators with the company strategy and focus, and frame the sensing of opportunities in the right direction towards the company strategy (Respondent6, 2012).

c) Co-specialization through Collaboration between Unit/Departments/External Parties

All respondents agreed that collaboration with people from different departments opens new perspectives and broadens the possibilities for innovation. That enables the engineer-innovators to sense opportunities about how they can leverage the skills and resources they have on the site by exploring new combinations of assets. By targeting opportunities that can be seized and transformed with resources readily available at the site, the chances increase for an innovative idea getting deployed, because they are less dependent on external permissions and funding (Respondent5, Respondent6, 2012).

> *'We have payment functionality, Machine to Machine activation, and a lot of other products in the site. If we bundle them together we can find really great ideas. What we made in the past was we looked around our product portfolio only and* the engineer-innovators *had their ideas only around the product. If you zoom out a little bit maybe you can find a lot of interesting product areas that no one touched.'* - Respondent6, 2012.

Moreover, cross-departmental collaboration enables employees to establish relationships with colleagues with complementary skills and form innovation teams that have technical, business and presentation capabilities (Respondent1, Respondent2, Respondent4, 2012).

'*Having a partner that's sees the same vision as you but has another background is very good for innovation*.' - Respondent2, 2012

Several respondents stated the positive influence that the Innovation Manager contributes to crosspollination by initiating networking events, such as the Innovation pub, where employees from different departments have the opportunity to present their interests and connect with people that share similar views. In addition to establishing connections between different departments, the Innovation manager stimulates connections with parties from outside the organization. This enables the engineer-innovators to look and sense opportunities outside their immediate focus. '*Having discussions with people from totally different areas. How can we apply our competence and knowledge in different areas…we talk to people from transport, ask them what their future needs would be*.' (Respondent5, 2012).

5.2.2 Identified Positive Influence on the Seizing of the Opportunities

a) Navigating Ideas to the Right Context

> *'(There were many challenges in innovation process) The first part was who should I tell the idea, where should I put the idea, who should I call, who should I talk to, who can help me, where can I get further information… today at least it's not that hard to get information. For example, people like the Innovation Manager…he is often out and speaking in the organization and unit meetings and describes what is going on and encourages people who have great ideas to speak to him…*' - Respondent1, 2012

The company's focus on selecting ideas that are screened and funded is strict and limited to the ideas that are within the strategic areas of the units, and the general strategy of where the company plans to go in the upcoming years (Respondent3, Respondent5, Respondent6, 2012). Hence, for ideas that are outside the strategic scope, it is very difficult to get funding and to convert and transform those ideas (Respondent1, Respondent2, Respondent3, Respondent4, Respondent5, Respondent6, 2012). Additionally, different competitions and innovation support activities focus on different topics within the bigger strategic innovation areas. Consequently, many good ideas get rejected when presented in the wrong context (Respondent1, 2012),

which leads to Type 1 errors. Although there are a number of innovation competitions, there is still a low awareness amongst the engineer-innovators about the best context to present their ideas. As a result, they sometimes end up applying with ideas in contexts that are not the most appropriate (Respondent1, 2012). Therefore, the role of the Innovation Manager in navigating the engineer-innovators to apply in the right context becomes crucial.

> *'I spoke to The Innovation Manager and he looked at my idea for a while, and said maybe it is better to apply in this competition instead of the one you've been planning to… One of my projects would have been rejected quite fast because it was not in the right context. But that was the only context I was aware of. Fortunately, the Innovation Manager informed me that there was a better context there for my idea, and I put it there…'* – Respondent1, 2012

b) Bridge creation: Facilitate Collaboration with External Consultants and Universities for Idea Conversion into Prototypes

> *'In the innovation, early phases, The Innovation Manager is doing a very good job because he can budget, find resources, student projects and do prototyping'* - Respondent1, 2012

Projects with university students serve as an ample opportunity to convert ideas into testable prototypes under low costs (Respondent3, Respondent4, Respondent6, 2012). This is an alternative route to converting the ideas into prototypes without having to screen and get funding from the Program Manager. Therefore, the contribution from the Innovation Manager is to be proactive in finding research activities, and establishing collaboration projects with universities, institutes and other offices (Respondent1, Respondent2, Respondent3, Respondent4, Respondent6, 2012)**.** The projects with external parties, especially students and universities not only contribute to prototyping solutions, but also often bring fresh perspectives, which help to tackle the closed and path dependent view that some of the engineers might have (Respondent1, Respondent2, 2012). Thus, the Innovation Manager constantly considers whether they are leveraging opportunities from outside the company (Respondent3, Respondent6 2012). In the literature this function has been described as the multi-channel funding model, as a solution to companies that have problems with converting and screening ideas in the Innovation Value Chain. That is due to the

screening and funding criteria, which are very strict and limited to ideas within specific areas which the 'management' likes (Birkinshaw and Hansen, 2007).

c) Decentralization and near Decompossability: Innovation Supportive Climate

Establishing innovation friendly climate and environment that supports successful conversion of good ideas into profitable products or businesses is critical to innovation (Respondent3, Respondent4, Respondent6, 2012). Support and encouragement of people with ideas play a big role especially under the context of Communic8, because there are many people with good ideas (Respondent1, Respondent2, Respondent3, 2012), but they are aware that converting and transforming an idea is not an easy task (Respondent2, 2012). Therefore, they choose not to even share the ideas, which negatively impacts the whole innovation process. The role of the Innovation Manager in supporting people with ideas is a vital enabler for seizing the opportunities.

> '*The Innovation Manager is often out and speaking in the organization and unit meetings and describing what is going on, for example innovation competitions...He is out and fishing for ideas and people with ideas…'* – Respondent1, 2012

> *'A lot of engineers here have really good ideas but they don't continue, they don't discuss, they just sit by themselves with their ideas doing nothing – it's important to promote the way of working together when you have the great functionality products. '* – Respondent6, 2012

To contribute towards creating an innovation friendly environment, the Innovation Manager collaborates closely with the Line Managers (Respondent3, Respondent4, Respondent5, Respondent6, 2012). All managers have reported acting like co-intrapreneurs and collaborating in order to provide innovative ways to support the people with ideas in their departments and the company in general. The Line Managers reported putting efforts in recognizing engineer-innovators and sending them to conferences, training so that they can continue to grow and develop (Respondent4, Respondent6, 2012). In addition, the Line Managers have actively engaged in self-initiated roles to support engineer-innovators and provide

opportunities to convert the good ideas, by providing proper resources, funding, student collaborations and stakeholders around selling the ideas (Respondent6, 2012).

> '*A guy that works in Communic8is fully booked from a program point of view, it's hard for them to find room to work with the innovative idea. That's my 1st part – to have dialogue with program managers to find room for engineer-innovators. Then, it's hard to get funding for the innovator to start develop the ideas because the program has a budget for specific products so they don't want to put money in other ideas that don't fit into the product. That's the other aspect – to define stakeholders that are really interested in the idea so they can help. I'm working closely with universities to see if there are students interested to work as master thesis with innovative ideas*' – Respondent6, 2012.

Both the Innovation Manager and the Line Managers actively contribute to creating an environment that makes it fun, challenging, motivating to innovate (Respondent3, Respondent4, Respondent5, Respondent6, 2012).

> *'Today we have competitions and challenges and it is quite fun to be part of that process. And the Innovation Manager is one strong contributor to that work'. – Respondent1, 2012*

> *'In the innovation, early phases, the Innovation Manager is doing a very good job because he can find resources and student projects and do prototyping. Also the Line Manager is very supportive because sometimes you need to spend some hours on this and you are not sure if the thing is going to be a good thing or a bad thing. The Line Manager is giving me some freedom to spend time. '*– Respondent2, 2012

This directly speaks about the contribution of the Innovation and Line managers to creating a supportive environment for the engineer-innovators to seize their ideas (Respondent1, Respondent2, 2012).

5.2.3 Identified Positive Influence on the Transforming of the Opportunities into Innovations

a) Innovation Governance: Lobbying and Diffusing the Idea

One of the commonly made mistakes in the innovation process is '**…** we think that everything will go by itself after the prototype' (Respondent6, 2012). However, experiences has shown that the transformation of the seized ideas is very challenging and requires management 'buy in' to support the emerging innovation and commit resources in the deployment process (Respondent1, Respondent2 Respondent4, Respondent5, 2012). At this stage, the Innovation Manager has a positive influence to the transformation process by engaging in dialogue with the Program Manager, and lobbying for the seized ideas in order to ensure space for the engineer-innovators to work on deployment of the ideas and products.

> '*...myself with help of the Innovation Manager have pushed the upper management (to realize) what do we need to do to make the innovation happen and have the winning idea from the competition get converted* '- Respondent4, 2012

The lobbying skills are especially important for ideas that are more future oriented and may not respond to the immediate short-term focus of the company (Respondent2, Respondent4, Respondent4, 2012). The theory describes this role as the 'Idea evangelist' - to act as catalysts and enable ideas to diffuse throughout the company (Birkinshaw and Hansen, 2007). Idea evangelists use their network to persuade the other employees to support a certain idea. By spreading the idea and getting supporters they facilitate the process of transformation of the idea into a product or business concept.

b) Networking and Negotiating: Strong Social Network

Different stages of the innovation process require engagement of different stakeholders.

'…*We have different stakeholders at the beginning phase, when you do the prototyping and another set of stakeholders and managers to bring at your side when you want to bring the product, with different budget and admissions. So, once you are done with the prototype and you have something to show you need to sell in your idea and show it as a value so that you can get some commitment of the ones that can take it to the market.*' (Respondent2, 2012).

Therefore, the ability to facilitate a multi-stakeholder engagement process during the whole Innovation Value Chain is crucial for getting the required management 'buy in' for transforming the ideas into innovations (Respondent2, Respondent3, Respondent5, Respondent6, 2012). The networking skills and the credibility of the Innovation manager help him engage the right stakeholders and push the ideas forward in the Innovation Value Chain (Respondent6, 2012).

c) Strategic fit: Systems thinking, Sense Making, Seeing the Big Picture

Finally, the greatest contribution to whether ideas get deployed and transformed into innovations or not, depend on whether they are seen as a good 'strategic fit' for the company (Respondent3, Respondent5, Respondent6, 2012). To assess the value of the ideas in being a good strategic fit, it requires an ability to see the big picture or the company system, skills and resources collectively (Respondent3, Respondent5, Respondent6, 2012). Teece (2007) identified the following managerial processes: coordination/integrating, learning, and reconfiguring as vital components of dynamic capabilities. In order to enhance the capability to support the coordination/integration, learning and reconfiguration, the role of the Innovation Manager as a Systems thinker and connector of the different dots of the Innovation Value Chain has been reported as crucial (Respondent3, Respondent5, Respondent6, 2012). The ability of the Innovation Manager to see the big picture of the Innovation Value Chain allows for 'orchestration' processes between the seemingly unconnected units/departments/assets. Teece (2007, 1341) recognizes that 'a key strategic function of management is to find new value-enhancing combinations inside the enterprise, and between and amongst enterprises, and with supporting institutions external to the enterprise.' To achieve this, the management needs to be able to integrate holistic knowledge of company processes and assets, that are 'knowledge related and hence nontradable'. By being able to integrate and align the cospecialized assets, the company can create a distinctive competitive advantage (Teece, 2007).

> *'The need for looking at the whole system could be developed more. Looking at motivations, if you look at every individual, they just work and do not see what others are working with. If they zoom out a little bit they will see what's in it for the operator, Product Manager…With the Innovation Manager's help we're trying to look from site's perspective – what we have here in the*

building. We have payment functionality, Machine-to-Machine activation, and a lot of other products and if we bundle them together we can find really great ideas. What we made in the past was we looked around our product portfolio only and the innovator had their ideas only around the product. If you zoom out a little bit maybe you can find a lot of interesting product areas that no one touched'. – Respondent6, 2012

5.3 Shell GameChanger Case: Example of Institutionalized Intrapreneurship

The following case depicts an example of how a big company with $138 billion in revenues and 102,000 employees could utilize intrapreneurship to support the sensing, seizing and transforming of opportunities into breakthrough innovations.

> *'Big companies are not markets, they're hierarchies. The guys at the top decide where the money goes. Unconventional ideas are forced to make a tortuous climb up the corporate pyramid.'* (Hamel, 1999, 76)

In the 1990s, Shell, the Anglo-Dutch oil giant, was a hierarchy-oriented organizational form with highly centralized decision making processes on funding for innovations. The company was under pressures to align the R&D and innovation focus on the immediate short-term production needs. This was shooting down the radical and visionary ideas and Shell was not an 'innovation friendly-zone (Hamel, 1999). The intrapreneurial behavior by Tim Warren, the director of research and technical services in Shell's largest division, lead to evoking intrapreneurial behavior among the innovative employees with the GameChanger Initiative. 1600 ideas came from the GameChanger, ensuring a constant flow of innovative ideas, unit track records of success, and more than 'forty percent of all development projects in the exploration and production business started out as GameChanger ventures' (Birkinshaw and Hansen, 2007, 121).

In order to address the bureaucratic command-control climate that was hurting the innovation efficiency, Shell Oil Company [5] launched the GameChanger Unit in 1996 (Hamel, 1999; Birkinshaw and Hansen, 2007). The aim of the unit was to provide support and funding for breakthrough and radical innovations that are not part of the narrow strategic focus of the company to get funding and develop into full-scale innovations or new spin-out ventures (Gibson, 2009). The initiative was taken by the Director of Research and Technical Services in Shell's largest division, who understood the importance of radical innovation and the negative impact that the existing bureaucratic culture had by discouraging the radical innovations. Having sensed the creativity and imaginations that the employees demonstrated, he decided to empower and give the authority to a unit of 'free-thinking' employees to act as internal venture capitalists and allocate $20 million to radical innovation ideas proposed by the peer-employees (Hamel, 1999).

The GameChanger Initiative is an applied example of how an Innovation Agent, could reconfigure the assets within a big company and support the development of innovation governance.

Sensing

Established processes to direct internal R&D and select new technologies and support for processes to tap development in exogenous Science and technology

Sensing is associated with learning about the environment and new technologies, as well as the ability to integrate and combine the existing assets within the company in new combinations that could unveil new opportunities (Teece, 2007). To operationalize this, it takes design of learning, knowledge sharing and knowledge integration procedures within the company (Teece, 2007). The GameChanger Project is an example of setting such procedures. In order to stimulate radical innovation thinking, the GameChanger Project involved an 'InnovationLab' workshop, where in three days the employees from diverse departments were brought together to be challenged and 'taught how to identify and challenge industry conventions, how to anticipate and exploit discontinuities of all kinds, and how to leverage Shell's competencies and assets in novel ways' (Hamel, 1999, 73-74). The result of the three day workshop was more than 240 ideas.

[5] Anglo-Dutch oil giant Royal Dutch/Shell Group

Seizing

Selecting Decision Making Protocols

Teece (2007) recognized that one way to address the centralized and hierarchical structure is to allow for 'participation at the board level by individuals who can calibrate whether the top management team is sufficiently 'dynamic'.' (Teece, 2007, 1339). The way that GameChanger project operationalized the 'decentralization' is by designing a panel of 'freethinking' employees who were authorized to make decisions for the ideas and innovations. The screening criteria for the selection of opportunities and ideas that were seizing and deployed was agreed by all participants in the workshops, which directly challenged the tradition of bureaucracy and centralized decision making that previously was solely done by the management.

Delineating the customer solution and the business model

The 'InnovationLab' was followed by an 'ActionLab' which ensured that the GameChanger project is not only a brainstorming activity. The 'ActionLab' involved a five days training in scoping and business sense actions, such as identifying strategic stakeholders and partners, evaluating the financial implications. Next, training in developing low cost efficient prototypes was organized in order to make sure the employees are equipped with knowledge to seize the ideas. Finally, the employees or teams that developed the ideas 'pitched' their innovations to the GameChanger Panel who collectively allocated resources for further development.

Transforming

Decentralization and Governance

Teece (2007, 1335) highlighted that in order for the company to sustain dynamic capabilities, it requires an approach that is based on decentralization because 'it brings top management closer to new technologies, the customer, and the market'. Menzel (2006) explained the need for the forward thinking employees to have the freedom to decide which opportunities to pursue and to get resource support, because they usually have better understanding of the opportunity than the emerging innovation, than the management and formal resource allocators have. The GameChanger project is an applied case of using and institutionalizing internal entrepreneurial behavior in Shell in order to support decentralization and autonomy for innovators. The decision

making authority was allocate in the hands of the GameChanger panel, composed of forward thinking engineers and managers. They meet every week to review the ideas and act as Innovation Agents and Coaches for the emerging innovations by directing the Innovators through the innovation process.

5.4 Who Should Play the Role of Intrapreneur?

The research in Communic8 clearly revealed that the role of Innovation Agent (IA) in the Innovation Value Chain is undertaken by the Innovation and Research Manager (Respondent1, Respondent2, Respondent3, Respondent4, Respondent5, Respondent6, 2012). This finding aligns with the theory and the research by Teece (2007), who underscores the need to design managerial processes—coordination/integrating, learning, and reconfiguring and place efforts in orchestrate the innovation process. The role of the Innovation and Research Manager as an IA was directly linked with 'continuous finding of new value-enhancing combinations inside the enterprise, and between and amongst enterprises, and with supporting institutions external to the enterprise' (Teece, 2007, 134; Respondent1, Respondent2, Respondent3, Respondent4, Respondent5, Respondent6, 2012).

In addition to that, the interviewed Line Managers and the engineer-innovators reported that the support from the Line Managers throughout the different stages of the Innovation Value Chain was found to be an important enabler for bringing the ideas forward to full scale innovations (Respondent1, Respondent2, Respondent4, 2012). However, the Line Managers reported that all intrapreneurial initiatives they undertake are self-initiated by their motivation to support innovation (Respondent4, Respondent6, 2012). The notion that was not part of the official role description often put them in situation to face the same challenge that engineer-innovators are facing i.e. lack of time to look at ways to support the innovator because they are overwhelmed with the daily production work (Respondent4, Respondent4, Respondent6, 2012).

Finally, although the intrapreneurship literature suggested that the engineers themselves take over the role of 'intrapreneurs', the research showed that the engineers lack most of the intrapreneurship skills such as presentation and negotiation

skills, or ability to see the big picture (Respondent1, Respondent2, Respondent3, 2012). Thus all respondents suggested the engineers should be provided with support by Innovation Agents and not be asked to take over intrapreneurial roles themselves.

The limitations to this set of results come from them being highly context dependent because the role of Innovation and Research Manager is specific to the particular site we have been looking at as part of the case study.

6. Conclusion and Implications

In this final chapter, the summary of the key findings will give perspective on the current innovation environment and innovation practices within Communic8 and how they relate to the dynamic capabilities, intrapreneurial skills and the problems highlighted in the problem discussion and formulation in section 1.2 and 1.3.

6.1 Summary of Findings

The purpose of this thesis was to explore the relationship between IA and the DC of the company to contribute to the management of innovation. We were looking at how the IA could positively influence the ability of the company to sense the right opportunities, seize and transform them into innovations, by identifying the critical intrapreneurial roles that IA can play in the innovation process.

Initially when the research on Communic8 commenced, we had set out to identify and establish the role of IA. It was expected that the role could be played by the engineers who could take ownership over the ideas and apply intrapreneurial skills to execute those ideas from generation to deployment. However, it emerged during the data collection and analysis that the role of the IA is not played by the engineers because they occur to be 'path dependent' and excel in their technical skills, while some of the intrapreneurial skills are not their strongest capacity. In addition, it was identified that Line Managers self-initiate intrapreneurial activities in order to support innovation in the firm, even though these roles were not part of their job description, they performed the roles of the IA. They could positively contribute to the DC of a company by engaging within the dynamic capabilities framework while using their intrapreneurial skills that were highlighted in the data analysis.
Finally, the strongest contribution to the positive influence in the Innovation Value Chain and sensing, seizing and transforming was attributed to the role that is currently played by the Innovation and Research Manager, who was described as the main IA.

Ultimately, based on the answer to the supporting research question it was possible to establish how the IA could positively influence the sensing, seizing and transforming of opportunities within the Innovation Value Chain. In order to build on

the specificities of the IA role, we identified possible skills that could be performed to positively influence the sensing, seizing and transforming within the dynamic capabilities framework.

6.2 Managerial Implications and Future Research

During our analysis in section 5.2, we identified 10 intrapreneurial skills and roles that could be simultaneously played by the IA. A roadmap to indicate and suggest possible focus areas was formulated. The Roadmap suggests where the various intrapreneurial roles of the Innovation Agents can be engaged. This roadmap would be placed within the Innovation Value Chain and align it to the dynamic capabilities framework. The roadmap is illustrated in Figure 6.1. The coloured dots indicate the intersection points where intrapreneurial roles can be engaged. The dotted line that spans across all three focus areas represents the intrapreneurial skills that can be carried out in all three focus areas. The key table below indicates the color code of each focus area.

	Focus Area 1
	Focus Area 2
	Focus Area 3

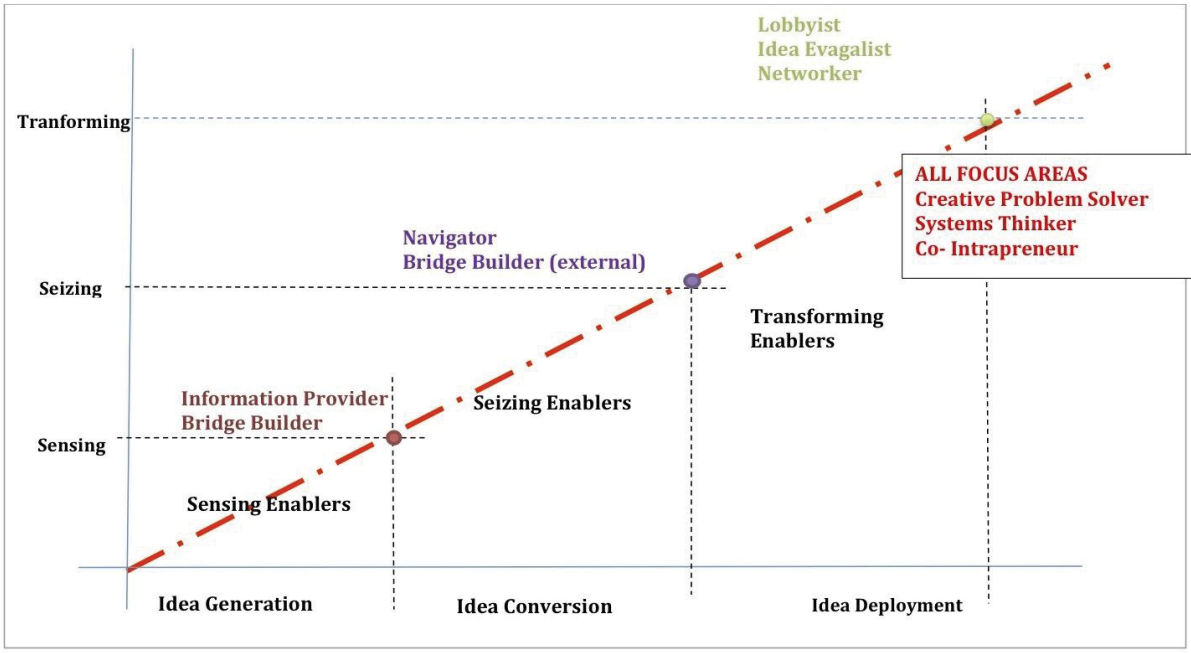


Figure 6.1 Innovation Agents Roadmap within the Dynamic Capabilities Framework

In Table 6.1 the 10 intrapreneurial skills that are characteristic of the IA are summarized based on which DC Framework focus area they address.

Table 6.1 *The 10 Intrapreneurial Skills categorized by the DC Framework and the Innovation Value Chain*

Intrapreneurship Focus Areas in Dynamic Capability Framework	Innovation Agent Skills	Skills Description
Sensing and Idea Generation	The Information Provider	Ability to close the information and knowledge gaps that exist in the company due to the size and hierarchy. This refers to designing processes that ensure that the employees and informed and aligned the company: strategy, structure and processes so that they can sense opportunities that are within the 'strategic fit'.
	The Bridge Builder (Internal)	Ability to establish platforms and processes that utilize cooperation between different units/departments, support co-specialization and knowledge integration. Maintain the connections between activities that happen in units/departments/projects that have considerable autonomy (to make decisions rapidly) but remain connected to activities that must be coordinated.
Seizing and Idea Conversion	The Navigator	Ability to sense the need for directing the internal R&D and innovation activities to the fit the right internal openings (Eg. Incentives such as competitions) and external (Eg. Delineating the customer solution and business model etc.).
	The Bridge Builder	Ability to scan the environment and establish relations and cooperation with external parties,

	(External)	and integrate external knowledge and know-how in the innovation processes of the company. Examples include platforms for cooperation with universities, customers, suppliers etc.
Transforming and Idea Deployment	The Lobbyist	Ability to establish strategic relations with the higher-level management in order to exert higher flexibility and resources to maneuver and work on innovation projects.
	The Idea Evangelist	Ability to design procedures that allow ideas to diffuse throughout the company and get the required supporters for the process of transformation of the idea into product or business concept.
	The Networker	Ability to establish strategic partnerships with stakeholders at different stages in the Innovation Value Chain in order to be able to utilize the connections for supporting the innovation deployment.
During the whole process	The Systems Thinker	Ability to see the 'Big Picture' of the Innovation Value Chain and 'orchestrate' the processes in a way that allows finding new value-enhancing combinations inside the enterprise, and between and amongst enterprises, and with supporting institutions external to the enterprise.
	The Creative Problem Solver	Ability to constantly design solutions to barriers in the innovation process and get access to resources and support from alternative sources.
	The Co-Intrapreneur	Ability to establish processes for close collaboration with Line Managers and Employees and collectively work on enhancing the innovation process.

6.2.1 Intrapreneurial Skills and Dynamic Capabilities

Based on the various IA intrapreneurial skills that were previously identified, we the researchers have prototyped a graph to depict the level of importance for each of the skills according to their contribution to the three phases of the dynamic capabilities framework. This process is illustrated in Figure 6.2 and can be used to verify where each of the intrapreneurial skills fit in the Roadmap. As seen in the figure below the proposed rating range for each skill is between one and five. One indicates a low level of contribution or importance, three indicate a medium contribution and importance and five indicates a high contribution and importance. Based on this initial prototype it would seem that the systems thinker is an important skill or attribute of the IA, as they have to look at the whole Innovation Value Chain. By looking from a systems perspective it is possible to see the relation between the different components of the Innovation Value Chain. There are other skills that seem predominant in certain phases, for example the creative problem solver and the information provider are important for both the sensing and seizing during in the Innovation Value Chain. The figure also shows the varying degrees or elastic nature of the Innovation Agent. They have to be able to play various roles at different parts in the innovation process.

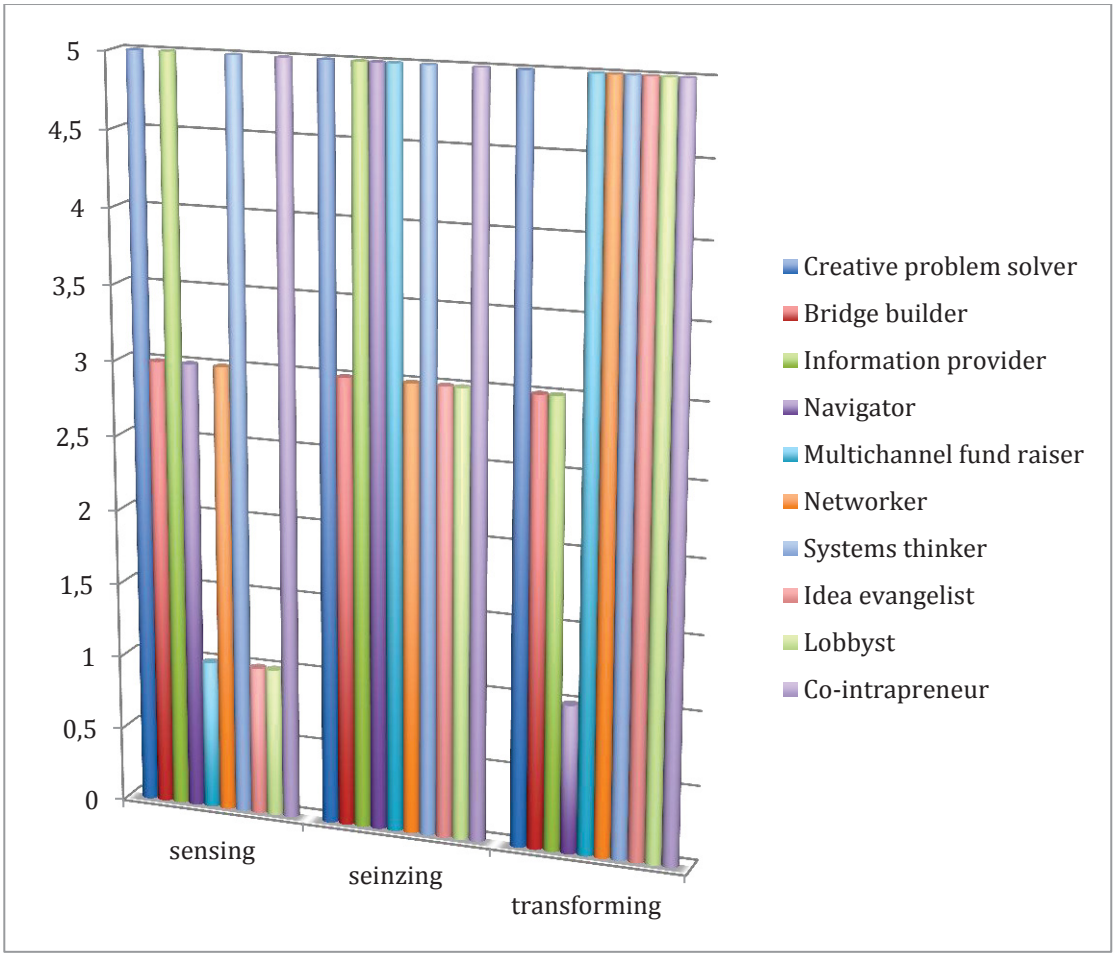


Figure 6.2 Intrapreneurial Skills per Dynamic Capabilities

We intend to validate this process with the Line Managers and the Innovation and Research Manager. The validation process would involve a rating table, similar to the one illustrated in Appendix D below. The process would involve giving some context information on the identified skills and their relation to the dynamic capabilities. This will then enable the above individuals to give an informed rating to the skills. We recommend the roadmap, the 10 intrapreneurial skills and everything in this section (6.2) for further research for enhanced theoretical and practical reasons.

6.3 The Findings and the Problem Formulation

The discussion of our results gave an insight into the key findings of our research which included the 10 intrapreneurial skills and the Innovation Roadmap. In the introduction, we had section 1.2 and 1.3 which comprised of the problem discussion and problem formulation. The essence of the problem was the how companies in the

in the high tech industry can manage an innovation process in a constantly changing dynamic environment and still maintain a competitive advantage.

- The need for companies to systemically master the complexity of the innovation process (Ahmed, 1998; Berkhout, Van Der Duin, and Hartmann, 2007; Bernstein and Singh, 2008; Galanakis 2006; Milling, 2001) and continually innovate in order to remain competitive (Menzel, 2007) and do that fast enough, as time is a strategic factor for gaining and maintaining a competitive advantage (Milling, 2001);
- The need to address the inertia that comes from risk aversion, competency trap and path dependency (Wei, 2006), which are inherent of big companies (Conceição, Hamill, and Pinheiro, 2002) and serve as innovation inhibitors (Assink, 2006);

This problem lead to our primary research question: how the Innovation Agents positively influence the sensing, seizing and transforming of opportunities within the Innovation Value Chain. In this section we will highlight the link between the problem and our key findings.

One of the main factors that emerged in the problem formulation was the need to master the complexity of the innovation process. In our research we have discovered that dynamic capabilities can be used to navigate through this complexity. In order to operationalize the DC, the intrapreneurial skills of the IA can be used within the innovation process. In the DC literature, a company that has these capabilities is characterized by the ability to exhibit a quick, prompt reaction and elastic forms of innovation activities that is integrated with managerial capabilities to manage both internal and external competences, and align with the changing and uncertain business environment (Teece, Pisano and Shuen, 1997). Through our research we identified the Innovation and Research Manager and the Line Managers in Communic8 as the individuals who could potentially play this role of prompting reactions and initiating and managing the elastic skills and forms of innovation activities. This then enables a way to navigate through the innovation complexity and maintain a competitive advantage.

In the company case, the importance of customer engagement emerged as an important component of a good innovation process as mentioned by all interviewees.

In the problem formulation it was emphasized that the changing customer and technology opportunities (Teece, Pisano and Shuen, 1997; Teece, 2007) in the dynamic environment are key to understand in order to have to understand the complexity of the innovation process. Based on our findings, we can suggest these customer and technology opportunities can be sensed, seized and transformed through the IAs.

Finally, in order to address the risk aversion, inertia and hierarchy that serve as innovation barriers, it was shown that it takes integrating and institutionalizing the intrapreneurship behavior in the core structure of the company. Having independent intrapreneurs acting in isolation does not provide solution to the problem. Thus, the primary role of the IA should be to work in concert with other managers as Co-intrapreneurs and design platforms that would allow utilization of the assets that are available in the company by exploring new value-enhancing combinations inside the company, and outside the company, between and amongst different companies and external parties and stakeholders. This underscores the need for having the IA to be constantly on alert for changes that come from inside and outside, and act as Innovator in the Innovation Value Chain by constantly coordination/integrating, learning, and reconfiguring the assets and competences.

6.4 Conclusion

In conclusion, it would appear that the role of the IA within the context of the company case is not only needed but appears to be an implicitly emerging role. Through our research we have been able to validate the need, identify and explore the role that can be played by the IA and how this role relates to intrapreneurial skills and the DC of the firm.

The contribution of this thesis is the Innovation Agent roadmap that highlights the intrapreneurial skills (competences) that can be played by the IA in the Innovation Value Chain in order to enhance the dynamic capabilities as operationalized by the DC framework.

Suggested areas for further research would involve exploring the strategic management and organizational structure implications that arise from the introduction of Innovation Agents and institutionalizing intrapreneurship within the company.

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Appendix

Appendix A: List of Interview Respondents

Name of respondent	Job function/Description	Date
Respondent 1	Engineer-innovator	Thursday 12 April 2012
Respondent 2	Engineer-innovator	Thursday 12 April 2012
Respondent 3	Program Manager Innovation and Research	Monday 16 April 2012
Respondent 4	Line Manager	Monday 16 April 2012
Respondent 5	Business Unit Manager	Monday 16 April 2012
Respondent 6	Line Manager	Monday 16 April 2012

Appendix B: Interview Guides

Interview Guide 1

	Interview questions for Engineers and Innovators
1.	Could you briefly describe your role in the Innovation Process
2.	Could you think of three successful innovation projects you were involved in and answer the following questions:
	a) What were the critical success factors and enablers for innovation?
	b) What were some barriers/challenges in the innovation process that you faced? How were these addressed?
3.	During an innovation process, what do you need help with in terms of resources and skills in order to:
	a) Identify the right opportunities and generate quality ideas;
	b) Convert the ideas into prototypes;
	c) Deploy those ideas into innovations?

4.	Could you think of three innovation projects that were not successful: What could have been done differently in order to make the project more successful in:
	a) Identifying the opportunity and generating the ideas?
	b) Capturing the opportunity?
	c) Transforming it into actual innovation?
5.	To what extent do you work closely with the Innovation Managers and people from other departments during the innovation process?
6.	How useful would it be if you could effectively connect with people that have similar ideas to your own and work together with them, when it comes to transforming the ideas into innovations?
7.	1. How much more motivated and find it more effective to execute an idea into an innovation if you were assigned to be the entrepreneur/manager of your idea project and be responsible for driving it from the beginning to the end?

Interview Guide 2

	Interview Questions for Innovation Managers
1.	Could you briefly tell us about your role in the Innovation Process?
2.	What are the critical success factors for innovation? (In other words, what are the critical roles/resources/competences necessary for successful innovation process?)
	a) Why are these factors important?
3.	a) What are some barriers/challenges in the innovation process?
	b) What are the most commonly made mistakes in the innovation process?
	c) How are these mistakes and barriers/challenges addressed?
4.	In your opinion, what are some of the gaps in establishing connections between different components of the innovation process in order to make the process more effective? (For example: between different departments, between employees with similar ideas, or any scenarios that come to mind…)
5.	How could the employees incorporate *entrepreneurial skills* in the innovation process in order to increase flexibility and deployment of ideas into innovations? (In other words, do you think that empowering employees to act like entrepreneurs within the company would positively influence the innovation process? Why?)
6.	How do you manage the conversion of ideas into innovations? (Put differently, how are decisions about which ideas/opportunities should be pursued made?)
	a) Do you see any weak links in this process?

Appendix C: Communic8's Vision

Service Driven Business

- Due to the complex nature of networks, service driven business has become key in supporting every aspect of operators businesses.

Technology Leadership

- Innovation is a key element to the company culture and is important component to the management of technology.

Close Customer Relationships

- Establishing strong and long term relationships with the customer is important to comprehending their business objective and technology needs

Sustainable Society

- Communic8 aims to reduce the carbon footprint through the use of telecommunications and establishing networks that are energy efficient.

Adapting to Consumer Needs

- Consumer insights provide tailored solutions and services to address consumer needs.

Unlimited Access

- Communic8 companyaims to support their customers by combining fixed and mobile networks to ensure access at all times.

All Things Connected

- The main objective is to have any person, organization, network or machine have the capability to connect to other components.

Broadband

- Broadband is a new and vital way of communication that enables people to communicate.

Appendix D: The Rating Grid

Role	Sensing	Seizing	Transforming
Creative problem solver	5	5	3
Bridge builder	5	3	3
Information provider	5	4	4
Navigator	2	5	1
Multichannel fund raiser	1	5	4
Negotiator	1	3	5
Systems thinker	5	5	5
Idea evangelist	1	3	5
Lobbyist	1	3	5
Co-Intrapreneur	5	5	5