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Business Models for Distributed Cloud

Application of Crowdsourcing for Business Model Development - a Study at Ericsson AB

Master's Thesis in the Master's Programme
Management and Economics of Innovation

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Abstract

An increased use of information technology has enabled new opportunities for companies to interact both internally and externally, resulting in new organizational processes that better capture the need of customers. One of these processes is crowdsourcing. Crowdsourcing has recently seen an uptake in both practice and research. However, companies still struggle to incorporate employees into strategic activities, and future research on crowdsourcing is called for. The purpose of this thesis is therefore to analyse the participation rate and results of an internal crowdsourcing initiative at Ericsson AB. This was achieved by addressing three research questions; what are the essential components of a business model for distributed cloud? What variables may influence the participation rate in an internal crowdsourcing initiative? What variables may influence the results of an internal crowdsourcing initiative?

To meet this purpose and to answer these research questions, both qualitative and quantitative methods were used. Interviews were held in order to address the first research question, and statistical data analyses were conducted to answer the other two research questions.

In total, seven hypotheses were formulated. Five hypotheses were supported by the statistical analyses, i.e., presence of monetary incentives increases the participation rate in crowdsourcing; the higher the perceived non-conformity (independence and criticality), the higher the participation in crowdsourcing; the presence of a moderator effect of monetary incentives on non-conformity (independence * criticality) decreases participation in crowdsourcing; the presence of a disruption setting in a crowdsourcing initiative increases the novelty of the resulting business models; the presence of a disruption setting in a crowdsourcing initiative decreases the workability of the resulting business models.

Factors affecting the participation rate and the results of a crowdsourcing initiative have been identified in this study, which may be of great importance for similar studies in the future. However, further research on crowdsourcing initiatives in other companies and with other contexts are called for.

Keywords: Crowdsourcing, Business Models, Strategy, Innovation, Motivational Factors, Social Movements, Social Activism, Distributed Cloud

Table of Contents

List of Tables

1 Introduction

This chapter introduces the background of this thesis, followed by the purpose and research questions. Thereafter, a delimitation of the study is explained. The chapter is concluded with a presentation of the report's disposition.

1.1 Background

Technology development and an increased connectedness of devices are revamping the relationship between customers and industry, forcing companies to adapt to a new surrounding (Sendler, 2017). Traditional strategic processes may become obsolete in a world characterised by increased global competition and technological complexity (Simula and Vouri, 2012). This development may necessitate a change from a production focus to a customer and market focus (Sendler, 2017).

An increased use of information technology has enabled new means for companies to interact both internally with their employees, and externally with their customers (Zuchowski et al., 2016). This advancement creates new organisational processes that better capture customers' demands, based on data driven decisions (Zuchowski et al., 2016). One of these processes is crowdsourcing (Zuchowski et al., 2016).

Crowdsourcing takes place online between an organisation that has an assignment it needs performed and a crowd that is willing to perform this assignment (Brabham, 2013). By using crowdsourcing, a crowd can collaborate in a social setting, sharing their ideas and experience for the benefit of the company (Malhotra et al., 2017). Instead of relying on a few experts, crowdsourcing could be beneficial by gathering ideas and knowledge from the many (Malhotra et al., 2017). This can be achieved by collecting knowledge and utilising the cognitive diversity that is scattered across many different locations, resulting in more efficient problem solving and higher job satisfaction (Malhotra et al., 2017).

Topics such as task description, motivation and quality assurance are of importance in the governance of a crowdsourcing initiative, to achieve satisfactory results (Zuchowski et al., 2016). Several authors have emphasized the importance of an accurate task formulation in the governance of a crowdsourcing initiative. If the task formulation is deficient, the quality of the answers will be impaired (Kittur et al., 2008; Boudreau et al., 2011; Simula and Vouri, 2012). Other factors may also have an impact on the outcome of a crowdsourcing initiative, e.g., if the participants are restricted in their creativity (Malhotra et al., 2017). Existing research cannot provide a clear answer to the relative importance and effect of different factors affecting motivation in a crowdsourcing initiative (Zuchowski et al., 2016), where different authors have proved contradictory results (Bonabeau, 2009; Simula and Vouri, 2012; Harper et al., 2008; Skopik et al., 2012; Muhdi and Boutellier, 2011; Antikainen et al., 2010).

Although crowdsourcing has recently seen an uptake in both practice and research (Zuchowski et al., 2016; Henttonen et al., 2017; Malhotra et al., 2017), companies still struggle to incorporate employees into strategic activities (Henttonen et al., 2017), and authors call for future research on the topic of crowdsourcing (Henttonen et al., 2017; Garrigos-Simon et al., 2015; Poetz and Schreier, 2012).

This study builds on existing research on crowdsourcing and answers the calls for further research on the topic of crowdsourcing and inherent variables affecting participation and the results of such initiatives. To achieve this, an internal crowdsourcing initiative at Ericsson AB in Stockholm was organised and later analysed. The initiative took place in the first half of 2018, where participants were invited and asked to share their ideas in the context of business models for distributed cloud.

1.2 Purpose and Research Questions

The purpose is to analyse the participation rate and results of an internal crowdsourcing initiative at Ericsson AB.

To fulfil this purpose and for the internal crowdsourcing initiative to be of high quality, a set of research questions were developed for the crowdsourcing initiative's participants to answer. The questions asked in this initiative needed to fulfil a set of requirements to be considered valid. First, the questions needed to capture the essence of what a business model entails, i.e., to reflect the components within existing business models. Second, the questions needed to capture the underlying context of distributed cloud, i.e., the technological advances which have created new requirements for the construction of business models. Third, the questions needed to meet the requirements of the chosen crowdsourcing platform, called CoDigital, in terms of extensiveness and to promote engagement in the initiative. Hence, the following research question was formulated:

RQ1: What are the essential components of a business model for distributed cloud?

A crowdsourcing initiative is also dependent upon the size of the crowd that is willing to participate. However, the process of inviting people to participate in a crowdsourcing initiative can be conducted in different ways, and various variables can affect the participation rate. Depending on e.g., how the invitation is formulated, different participation rates can be obtained in a crowdsourcing initiative. It is therefore important to analyse how different variables affect participants' motivation to participate in an internal crowdsourcing initiative. Hence, the following research question was formulated:

RQ2: What variables may influence the participation rate in an internal crowdsourcing initiative?

The results of an internal crowdsourcing initiative can also vary depending on how the initiative is conducted and governed, where different variables can influence the results. Hence, the following research question was formulated:

RQ3: What variables may influence the results of an internal crowdsourcing initiative?

1.3 Delimitation

A delimitation has been made to increase the quality of the research. The crowdsourcing platform that was used in the crowdsourcing initiative was not analysed in terms of features, layout or effects. This platform was handed to the authors by Ericsson AB, who had used the platform in a previous research initiative with positive results. Therefore, the platform was considered to be appropriate without any further investigation.

1.4 Disposition

After the introduction in chapter 1, a literature overview is presented in chapter 2. This chapter describes literature used to develop the underlying hypotheses. In chapter 3, the research approach is presented. This chapter will explain the overall design, setting and process of the research. Following this, the created business model framework is presented and analysed in chapter 4. This chapter presents the process of developing a business model framework, including the qualitative methods used, the process of ensuring validity and the resulting components of the business model framework. Chapter 5 continues with presenting the invitation phase of the crowdsourcing initiative. This includes the established hypotheses for this phase, a description of the invitation process, and a statistical analysis of the collected data. After that, chapter 6 presents how the crowdsourcing initiative was conducted. This includes a description of the established hypotheses, how the crowdsourcing initiative was governed and a statistical analysis of the collected data. The results will then be discussed in chapter 7, followed by concluding thoughts in chapter 8.

2 Literature Overview

In this chapter, literature is presented for the purpose of guiding the development of questions for the crowdsourcing initiative, i.e., the business model framework. Further data will be presented that will be used for formulation of hypotheses on participation rate and results of the crowdsourcing initiative. The first section presents literature on the topic of business models, which is used for the construction of the business model framework. The second section presents literature on crowdsourcing and possible variables that may affect participation rate and the results of a crowdsourcing initiative, to aid in the later formulation of hypotheses. The third section presents literature on social movements and activism, where further variables that may affect participation rate are presented to guide in the formulation of hypotheses.

2.1 Business Models

This section presents literature about business models, which will later be used in the construction of the business model framework. First, background about business models in general is presented, to increase understanding of the topic. A definition of business models that is well used within literature is also presented. In the last section, literature on the internet of things and how it affects the content and formulation of business models is presented.

2.1.1 Background

The importance of business models is widely accepted within literature (Magretta, 2002; Björkdahl, 2009; Chesbrough and Rosenbloom, 2002; Björkdahl and Holmen, 2013; Hacklin et al., 2017), where companies with similar offerings may have varying performance (Björkdahl and Holmen, 2013). Magretta (2002) state that business models are essential for the success of companies. The author further argues that a business model should tell a story about who the customers are, what they value, and how to make money from this. Magretta also mention that a novel business mode, that is difficult to replicate, may create a competitive advantage and change the economics of an industry. Björkdahl (2009) state that business models are important for the successfully capture of the inherent value in a new technology. Chesbrough and Rosenbloom (2002) also mention that business models are important for unlocking a technology's latent value.

The notion of a business model is however not explicitly defined, and varying definitions and interpretations appear throughout literature, depending on the theoretical perspectives and lenses applied by the authors (Andreini and Bettinelli, 2017). Teece (2010) describes a business model as "the design or architecture of the value creation, delivery, and capture mechanisms it employs" (Teece, 2010, pp.172). This definition by Teece (2010) is similar or consistent with most of the current definitions of business models (Foss and Saebi, 2017). Hereafter, this definition by Teece (2010) is chosen as the definition of a business model for this study. The rationale for this choice is to obtain higher concept clarity by an increased understanding, but also to aid coordination efforts related to the research, as mentioned by Foss and Saebi (2017).

Although the definition and terminology of a business model varies throughout literature, as represented by the systematic literature review by Andreini and Bettinelli (2017), the components of business models are stated as a point of convergence (Foss and Saebi, 2017).

Foss and Saebi (2017) explain that these components are related to either the creation of value, the mechanism and value chain behind the realisation of this created value; the value capture, or the architecture linking these factors together. Andreini and Bettinelli (2017) further argue that consensus seem to exist concerning three core aspects, i.e., firms' dynamic way to make business is captured in the concept of business model, the three parts of capture value, creating value and deliver value is handled in the business models. Studies on business models may be useful concerning research about boundary-spanning innovation (Andreini and Bettinelli, 2017). Björkdahl (2009) states that the notion of a business model is muddled, albeit heavily studied since mid-1990. The author further states that the different conceptualisations of a business model have a common denominator; that they all mention how to capture and create value.

Sinfield et al. (2012) have conducted studies on business model components and they have identified six central questions of a business model. These questions are explained to be handled in the majority of business models generated by researchers (Sinfield et al., 2012). The six questions are: "*1. Who is the target customer? 2. What need is met for the customer? 3. What offering will we provide to address that need? 4. How do the customer gain access to the offering? 5. What role will our business play in providing the offering? 6. How will our business earn a profit?*" (Sinfield et al., 2012, p.86).

2.1.2 Business Model Frameworks

Osterwalder and Pigneur (2010) mention the importance of a shared understanding of business models as a concept. The authors further state that a framework may facilitate discussion around business models. However, the challenge is to make a framework that is relevant, simple and understandable, but at the same time capture the complexity of the function of a company (Osterwalder and Pigneur, 2010). St. Gallen's magic triangle and Osterwalder and Pigneur's business model canvas are two frameworks of business models. These frameworks are well cited in literature (Kinitzki and Hartweck, 2017; Bilgeri et al., 2015), where Osterwalder and Pigneur's business model canvas is also well used within industry. Additionally, the two frameworks are explained to be good for the development of new business models for emerging internet of things applications (Bilgeri et al., 2015).

Bilgeri et al. (2015) state that both Osterwalder and Pigneur's business model canvas and St. Gallen's magic triangle offer specific advantages and the choice between the two should be dependent upon case suitability and personal preferences. Osterwalder and Pigneur's canvas is explained to offer a more detailed description of the business model, i.e., it has more components (Bilgeri et al., 2015). It is also stated to be the more widely used and acknowledged (Bilgeri et al., 2015). St. Gallen's magic triangle is described as having an advantage based on its simplicity, making the model easy to use in a workshop setting (Bilgeri et al., 2015).

Osterwalder and Pigneur (2010) state that a business model aims to describe how an organisation intends to earn money using the business model canvas, consisting of nine different components, i.e., customer segments, value proposition, channels, customer relationships, revenue streams, key resources, key activity, key partnership and cost structure. The nine components are related to four different categories, i.e., financial viability, infrastructure, offering and customer (Osterwalder and Pigneur, 2010). Gassmann et al. (2013) conceptualise business models into four central dimensions, i.e., Who, What, How and Value. These dimensions are known as St. Gallen's magic triangle, which is explained by

Gassmann et al. (2013) to be simple and easy to use. However, the business model architecture is still explained to be exhaustive in terms of what a business model should entail (Gassmann et al., 2013). Gassmann et al. (2013) further argue that St. Gallen's magic triangle combines factors from both outside and within the focal firm, thus providing a holistic view of the business and a boundary-spanning view of the concept of business model. This is explained to be important in a real world where the business model of a firm is subject to many interdependencies as a part of a complex system (Gassmann et al., 2013).

2.1.3 Business Model for Internet of Things

The internet of things is said to change the business landscape, creating new possibilities for innovative business models (Sendler, 2017). Björkdahl (2009) states that to capture value from technological investments, the business model needs to be subject to change. Hacklin et al. (2017) further argue that proactively pivoting your business model is important, and may improve the company's value creation and value capturing. Business model innovation is explained by Björkdahl and Holmen (2013) as the implementation of a new business model, and the activities related to it. The authors mention a number of factors for why business model innovation is important. They state that an internationalisation of markets has made traditional business models inadequate, where firms no longer can compete solely on manufacturing processes or on products. Björkdahl and Holmen (2013) also mention that business model innovation has been argued to have a higher impact on profit margin than other sorts of innovation.

How business models will be affected by the internet of things is studied within literature (e.g., Westerlund et al., 2014; Chan, 2015; Wirtz et al., 2010; Palattella et al., 2016), where changes to the business environment is said to induce a specific set of requirements on the new business models (Bilgeri et al., 2015). A complicated value stack must be handled before the promised advantages and possibilities of Internet of Things can be realised (Bilgeri et al., 2015). Bilgeri et al. (2015) have identified a set of requirements that are specific for business models related to Internet of Things and that must be addressed. These are extended scope to an ecosystem level, visualisation and support of the complex stakeholder network, value proposition of all key stakeholders, and a specific consideration of data as an asset (Bilgeri et al., 2015).

The first requirement is that the scope of the business model must include the whole ecosystem, an extension from firm level to an ecosystem level (Bilgeri et al., 2015). Bilgeri et al. (2015) explain this by the fact that the value creation does not happen only by the focal firm. Instead, value is created in multiple directions and by many different actors, e.g., customers, users or partners (Bilgeri et al., 2015). To maximise the value for the targeted end customer, a holistic view needs to be taken where all relevant stakeholders are regarded in contrast to their contribution (Bilgeri et al., 2015).

Traditional value chains assume linear relationships from supplier to the focal firm and down to end customer (Bilgeri et al., 2015). In the Internet of Things context, this approach fails to capture the value added, and new ways of illustrating the stakeholder network is needed (Bilgeri et al., 2015). These new ways need to allow for dependencies and synergies between nodes to be identified (Bilgeri et al., 2015).

Having a sustainable ecosystem includes mutual benefit and incentives for all involved stakeholders (Bilgeri et al., 2015). Therefore, the value proposition needs to be explicitly

considered for all key stakeholders in an early stage of the development of the business model (Bilgeri et al., 2015).

Internet of Things means a huge increase in connected devices with large potential of capturing data (Bilgeri et al., 2015). Data is therefore explained by the authors to have potential to be leveraged and should be seen as an opportunity. Data could be leveraged in different manners, e.g., through selling as a value adding service in subsequent, or the same, business model (Bilgeri et al., 2015).

Bilgeri et al. (2015) have constructed a procedure for the development of business models for emerging Internet of Things applications, which is called *the IoT business model builder*. This procedure is based on discussions around Osterwalder and Pigneur's business model canvas or St. Gallen's magic triangle, which are explained as good bases for developing new business models for emerging Internet of Things applications (Bilgeri et al., 2015).

2.2 Crowdsourcing

In this section, literature about crowdsourcing will be presented to increase the readers understanding and to aid in the formulation of hypotheses for the crowdsourcing invitation and initiative. In the first section, internal crowdsourcing is described and further defined. The definition was chosen based on its simplicity and similarity to most other definitions of internal crowdsourcing. Different areas of application for internal crowdsourcing are then presented to create a context for this study. The chapter will conclude by presenting literature on factors affecting the participation rate and the outcome quality of internal crowdsourcing. The presented factors were chosen based on the gap in existing literature and the calls for further research concerning these factors.

2.2.1 Internal Crowdsourcing

Crowdsourcing is a process that is dependent on a large group of people and their ideational potential and can be divided into internal and external crowdsourcing (Zuchowski et al., 2016). In external crowdsourcing, the crowd consists of external people and end users, whereas internal crowdsourcing is based on a crowd that consists of internal people, i.e., employees in enterprises (Zuchowski et al., 2016).

Internal crowdsourcing has a number of properties that makes it distinctly different from other forms of crowdsourcing (Zuchowski et al., 2016). Using internal identifiable employees instead of external users, confidential and competitive information can be shared (Zuchowski et al., 2016). Zuchowski et al. (2016) define internal crowdsourcing as: "Internal crowdsourcing is an (a) IT-enabled (b) group activity based on an (c) open call for participation (d) in an enterprise." (Zuchowski et al., 2016, p.168). Using this definition, external crowdsourcing is hereafter referred to those forms of crowdsourcing that are not applicable to this definition.

Crowdsourcing has theoretically been explained as a new source of innovation, by creating new ideas that solve problems effectively (Simula and Vouri, 2012; Malhotra et al., 2017; Henttonen et al., 2017). Instead of relying on a few experts, crowdsourcing can be beneficial by gathering the ideas and knowledge from the many (Malhotra et al., 2017). Henttonen et al. (2017) also state the importance of internal crowdsourcing, since it leads to increased

knowledge sharing and interactions, which is the basis for innovation. The cultivation of the wisdom of the participants makes internal crowdsourcing a vehicle for improvements and innovation, where potential exists in every employee with specific knowledge (Henttonen et al., 2017).

Internal crowdsourcing can also be described as a process for enabling employees to share their ideas (Malhotra et al., 2017). By enabling the employees to share their ideas and work in a collaborative setting, a higher job satisfaction and better moral can be obtained (Malhotra et al., 2017). The participants may also have good knowledge of specific needs and pain-points of customers, but it is more difficult for the participants to figure out a specific solution (Malhotra et al., 2017). Relative to external crowdsourcing, internal crowdsourcing has more localised knowledge potentially leading to ideas that are easier and faster to develop into workable actions (Malhotra et al., 2017).

2.2.2 Applications of Internal Crowdsourcing

Different problems or tasks can be conducted with the help of internal crowdsourcing (Zuchowski et al., 2016). According to Zuchowski et al. (2016), internal crowdsourcing can help address three different types of problem, i.e., collective intelligence, design and decisions.

According to Zuchowski et al. (2016), collective intelligence refers to the aggregation of knowledge and information into one common format and place, through gathering a lot of information from scattered places and people. Internal crowdsourcing is also explained by Zuchowski et al. (2016) to be efficient in e.g., predicting project completion dates and product demand. Internal crowdsourcing thereby also increases the amount of social interactions which may act positively on an enterprise's overall knowledge quantity, through higher social capital of the people involved (Zuchowski et al., 2016).

Design refers to the development of products and services (Zuchowski et al., 2016). As internal crowdsourcing involves more people into development work, people outside the formal job hierarchy can contribute and ideas previously unheard of can reach a wider audience, including management (Zuchowski et al., 2016). Internal crowdsourcing may thereby provide a new and effective platform for generating and sharing new ideas and solutions (Zuchowski et al., 2016).

The last problem explained by Zuchowski et al. (2016) refers to decisions between existing solutions. Zuchowski et al. (2016) further state that choosing the right idea or alternative is often crucial for companies and systematic decision-making processes are in many cases lacking. Using internal crowdsourcing, the decision-making process becomes democratic through a voting system, often leading to good choices between alternatives (Zuchowski et al., 2016).

Idea generation is still a phase were an ideal process has not been identified by scholars (Ulrich, 2006). Scepticism has been directed towards the crowd's potential of generating new product ideas (Poetz and Schreier, 2012). Ulrich (2006) argues that expertise is required to develop promising and novel ideas that would be appealing to a broader range of the market. However, Jeppesen and Frederiksen (2006) argue that peoples' knowledge of the customers' needs may create good ideas for new products (Poetz and Schreier, 2012). The value of internal crowdsourcing for idea generation and problem solving has been demonstrated by

companies such as McKinsey and Co, Siemens and SAP (Simula and Vouri, 2012). Poetz et al. (2012) made a study comparing a crowd's ability of generating new product ideas, with individual experts. Poetz and Schreier (2012) found that the ideas generated by the crowd showed significant higher scores in terms of novelty and customer benefit. However, the ideas generated by experts showed higher scores related to the feasibility of their ideas (Poetz and Schreier, 2012). Albeit extensive research has been conducted on the area of a crowd's potential of generating high quality ideas (Poetz and Schreier, 2012; Hentonen et al., 2017; Kristensson et al., 2004; Ulrich, 2006; Simula and Vouri, 2012), future empirical research is called for (Poetz and Schreier, 2012; Henttonen et al., 2017; Simula and Vouri, 2012).

2.2.3 Governance of Crowdsourcing

The governance of an internal crowdsourcing initiative includes the actions and policies used to manage and govern the study (Zuchowski et al., 2016). Zuchowski et al. (2016) explain six different areas of governance that are of importance, i.e., "management of corporate culture and change, incentive design, task definition and decomposition, quality assurance, community management, and management of regulation and legal implications." (Zuchowski et al., 2016, p.171).

Incentive design relates to the benefit of participation, or motivational factors, for the internal crowd (Zuchowski et al., 2016). Motivational factors related to internal crowdsourcing are internal and external factors affecting initial and continued efforts, contribution and engagement (Muhdi and Boutellier, 2011). Studies have been conducted related to the motivational factors of internal crowdsourcing, e.g., monetary rewards, enjoyment, reciprocity and peer and firm recognition (Muhdi and Boutellier, 2011; Simula and Vouri, 2012; Skopik et al., 2012; Zuchowski et al., 2016; Bonabeau, 2009; Lerner and Tirole, 2002; Jeppessen et al., 2006).

Some scholars have argued that motivation or incentives are of no importance for internal crowdsourcing, since the crowd is paid salary whilst participating (Skopik et al., 2012). Muhdi and Boutellier (2011) found that both monetary and non-monetary rewards showed no significance. Antikainen et al. (2010) instead argued that monetary rewards are not sufficient on its own to motivate collaborative work. However, other scholars argue that incentives are equally important for internal crowdsourcing as for other forms of crowdsourcing (Bonabeau, 2009; Simula and Vouri, 2012).

The nature of the community and participants are of great importance for the outcome of the internal crowdsourcing (Zuchowski et al., 2016). Knowing which factors that affect participants' motivation are therefore essential, but existing research cannot provide a clear answer to the relative importance and effect of these different incentives on internal crowdsourcing (Zuchowski et al., 2016). Contradictory results have been identified by different authors, where some authors have identified monetary and non-monetary rewards as important (Bonabeau, 2009; Simula and Vouri. 2012; Harper et al., 2008) while other authors deem these as less important (Skopik et al., 2012; Muhdi and Boutellier, 2011; Antikainen et al., 2010).

Several authors have also emphasized the importance of a careful task formulation when conducting a crowdsourcing initiative, where a lacking task formulation could lead to lower quality answers (Kittur et al., 2008; Boudreau et al., 2011; Simula and Vouri, 2012).

Furthermore, there are roadblocks that may potentially hinder a successful implementation of internal crowdsourcing, e.g., that companies may ask participants for incremental and evolutionary improvements of existing products or processes, instead of encouraging creative and disruptive thinking (Malhotra et al., 2017). Doing this may distort the participants' interpretation of the purpose behind the internal crowdsourcing process and how the process differs from other corporate initiatives (Malhotra et al., 2017). Several other researchers have also looked into the subjects of evolution and disruption (e.g., Miller, 1982; Christensen and Overdorf, 2000). Miller (1982) mention that disruptive changes may often be more costly than evolutionary ones.

2.3 Social Movements and Activism

This section will present literature on social movements and social activism. These topics are well researched and therefore presented to aid in the formulation of hypotheses related to the participation rate.

2.3.1 Social Movements

Zald and Berger (1978) write about bureaucratic insurgency, which is explained as a social movement with the aim of changing some aspect of an organisational function. Three major types of insurgencies are also introduced by the authors, i.e., program or product development, policy choice and whistle blowing (Zald and Berger, 1978).

In product and program development, overall goal setting by authority is accepted, but new techniques are introduced for improving and accomplishing organisational goals and programs (Zald and Berger, 2018). Hence, Zald and Berger (1978) formulated a hypothesis that insurgencies are more likely to occur when an independent base is provided to perspectives on policies, goals and products (Zald and Berger, 1978). The authors also write another hypothesis related to the recruitment of participants, i.e., employees that are critical towards existing conditions are more likely to participate in social movements than members supportive of existing conditions (Zald and Berger, 1978).

2.3.2 Social Activism

Briscoe and Gupta (2016) define a social activist as: "Individuals or groups involved in collective action to remedy perceived social problem. Social activists operate through groups or Social movements organisations (SMOs) characterized by varying degree of formal and informal organisation" (Briscoe and Gupta, 2016, p.5). A result of using this definition, organisational change and both unintentional and intentional effects on the organisation are implied as results of social activism (Briscoe and Gupta, 2016).

Social activists frequently exist in organisations with the aim of changing organisational practices and policies (Briscoe and Gupta, 2016). Different types of social activists have been identified, i.e., insiders, which are employed by the targeted organisation and outsiders which are instead independent of the targeted organisation (Briscoe and Gupta, 2016). Depending on the type of social activities, the outcomes of activism will differ (Briscoe and Gupta, 2016).

Social activism has been approached from various directions in literature, by using diverse epistemological, theoretical and empirical lenses (Briscoe and Gupta, 2016). Social activists'

influential capacity of their efforts, have also been explained in literature through various structural factors and mechanisms (Briscoe and Gupta, 2016). One of these mechanisms is the mobilisation of activists in relation to the focused company (Briscoe and Gupta, 2016).

Weber and Waeger (2017) describe mobilisation of a collective action as a promising mean for employees to advance their goals, especially middle- and lower-level employees. The authors further stress the importance of incorporating employees from different hierarchical units and levels in order for the mobilisation to be successful.

Being a social activist inside the targeted organisation is explained to limit a person's capacity to influence and strategise (Briscoe and Gupta, 2016). With higher dependence on the targeted organisation, a social activist may become constrained in their willingness to press their goals or express discontent (Briscoe and Gupta, 2016). Higher dependency is also explained to negatively affect peoples' willingness to participate in disruptive activism and is defined as activism that is related to large changes and costs (Briscoe and Gupta, 2016). Given that employees have a higher dependency on the targeted company than an outsider, employees face higher uncertainty and personal risks when engaging in activism due to their high dependence (Briscoe and Gupta, 2016). Several other studies have also been conducted concerning effects of criticality and dependence (Kelley, 1988; Blanchard et al., 2009).

3 Research Approach

In this chapter the research setting, design and process are presented. In the research setting, Ericsson AB is described. Following that, the choice and rationale of the methodological approach is presented in the research design section. Finally, the research process is described.

3.1 Research Setting

This thesis is written in cooperation with BTEB ER Research Incubation at Ericsson AB in Stockholm. Ericsson AB is one of the world's leading firms in providing information and communication technology to service providers (Ericsson AB). Ericsson AB is a company with a long history, having operated for more than 100 years (Ericsson AB), and today approximately 40% of the world's data traffic run through Ericsson AB's network infrastructure (Ericsson AB).

Ericsson AB currently works with distributed cloud as a part of their 5G platform that they sell to customers (Ericsson AB). Cloud power is explained to be an important part in order to monetise cloud capabilities (Ericsson AB). Distributed cloud is also explained to be an important part of preparing Ericsson AB's customers infrastructure for future business (Ericsson AB). This can be achieved by scaling and deploying their current Network Functions Virtualisation infrastructure, implementing network slicing and implementing service orchestration, and expanding into multiple sites (Ericsson AB).

3.2 Research Design

This project is predominantly quantitative-based, but also incorporates qualitative research methods in the work leading up to the crowdsourcing initiative. As such, the mixed-methodology used can be described as a sequential qualitative-quantitative design, as opposed to a simultaneous qualitative-quantitative design (Kelle, 2006). The qualitative data collection will be used to create an understanding of the primary problem and for hypotheses development. This will be followed by the crowdsourcing initiative, by which statistical analysis will explore data on a larger scale. One reason for this combination is to reduce the weaknesses and limitations of using only a single method and also serves to render a more complete picture of the research topic (Kelle, 2006). These limitations include validity pitfalls because of the limited sample size in a qualitative research approach, and the lack of "sociocultural 'local' knowledge", by which quantitative research fails to capture the core problems of the research topic (Kelle, 2006, p. 307). These limitations are avoided by combining these methods, as the qualitative research will serve to generate knowledge of the context.

There are three main purposes of collecting qualitative data in this study. The first purpose is to receive a broad and in-depth understanding of the context of distributed cloud and current ways of strategy and business model development at Ericsson AB. The second purpose is to use this data to create the business model framework to be used in the crowdsourcing initiative. Third, the qualitative data will support the creation of hypotheses and treatments for the crowdsourcing initiative. In this sense, the qualitative data collection can be described as exploratory, with the purpose to support the preparation of the crowdsourcing initiative. As

mentioned by Bryman and Bell (2007), qualitative research focuses on understanding of the social world, which is why qualitative research would be the appropriate tool to use for these purposes. This argument is enforced by Corbin and Strauss (2008), who mention that qualitative research is used to discover rather than test variables. In this study, the qualitative data is collected both through interviews and through literary work.

The rationale of using a quantitative research approach is because this project aims to find correlations between different variables affecting participation in crowdsourcing and the crowdsourcing project's results. Moreover, the large number of participants in the crowdsourcing project is another factor for choosing a quantitative approach, as analysing the data will be more feasible for such a large scale. As such, the crowdsourcing initiative can be described as an experimental study, where regression models will be used to answer established hypotheses and explain the degree of correlation between dependent and manipulated independent variables.

3.3 Research Process

This study entails three distinct phases which follow a hierarchical structure, i.e., building on the results found in the previous phase. The three phases correlate to the three research questions established in the introductory chapter, with the purpose to answer these independently. As such, the first phase is the business model framework development (chapter 4), followed by the crowdsourcing invitation (chapter 5) and the crowdsourcing initiative (chapter 6). Because of this research structure, the method and process of each phase will be introduced within each respective phase, rather than extracted into a chapter on its own. The rationale for this structure is improved clarity of the methodology by following a chronological structure.

4 Business Model Framework Development

This chapter present the business model framework that was developed, together with the related background and analysis. The first section describes the method behind the empirical data gathering, together with the sampling. After that, the interview results are presented and analysed, before the final business model framework is presented. This framework is thereafter used in the crowdsourcing initiative described in chapter 6 and 7.

4.1 Interviews

The qualitative data collection can be seen as the background research needed to be conducted to successfully be able to conduct the crowdsourcing initiative. This chapter describes how data was collected through interviews.

4.1.1 Interview Method

This section is divided into three parts, sampling, interviews and analysis. Sampling includes descriptions of the techniques used to sample participants for the interviews. The interviews section describes the creation of the interview framework and conducting the interviews. The analysis part presents how the collected qualitative data can be used in the creation of a business model framework.

4.1.1.1 Sampling

Robinson (2014) describes interview sampling as a four-stage process. First, a sample universe is established (Robinson, 2014). This step involves defining the total population of potential interview candidates and can be achieved by creating inclusion criteria, i.e., attributes that the sample population must have, or exclusion criteria, i.e., attributes that sample population shall not have (Robinson, 2014). In this research, the sample universe was created by examining an internal hierarchy list of departments at Ericsson AB. The inclusion criterion was set as departments who were affiliated with distributed cloud, internet of things or strategy development. Once relevant departments had been filtered out, employees working in those departments were found by looking through the departments' employees list and finding their contact email. The rationale for selecting these departments was that they would have the deepest insight and broadest knowledge about this thesis' context and therefore best suited to be interviewed. This filtering resulted in a list of hundreds of employees.

The second step in the process is described as selecting a sample size, depending both on what is ideal and what is practical (Robinson, 2014). Furthermore, Robinson (2014) mentions that a decision on a provisional sample size needs to be made in the preparation phase of the research, to plan the duration and resource allocation of a research project. In this research, an estimation of approximately 10 interviewees was made. This sample size was chosen because of several reasons. First, conducting 10 interviews was estimated to result in enough findings to make valid conclusions. Second, the purpose of this stage was to hear the opinions of the employees to create understanding through individual interview analysis rather than conduct extensive analysis on a quantitatively large set of interviews. Robinson (2014) refers to this type of study as idiographic and gives a guideline of 3-16 interviewees for this type of research. Nevertheless, the number of 10 interviews in this phase was just an estimate and was subject to change if a need for further interviews was necessary. In this regard, the interviews

were continuously transcribed and analysed for the purpose of judging whether empirical data saturation had been reached and whether expansion or reduction of the sample size was necessary.

Third, Robinson (2014) describes the selection of a sample strategy. This step involves selecting interview candidates from the sample universe. This can be conducted through two distinct strategies, either through random sampling or through purposive sampling, i.e., in random or respectively non-random way (Robinson, 2014). Robinson (2014) describes purposive sampling as choosing participants who may in some way offer a more important or unique perspective on the interview topic. As the intention of the interviews was to create understanding of the context, using a random selection process served no purpose. Instead, in accordance with the purposive sampling method, interviewees were selected by if they in some way worked with distributed cloud, or internet of things, from an engineering, marketing or strategy perspective. The chosen sample was evaluated through the relevance of their title to the inclusion criterion and whether they had published anything on the topic, either on Ericsson AB's internal portal or externally.

Robinson (2014) describes the final step of the process as inviting the interview participants. Robinson (2014) mentions a few key criteria for success, which include informing the potential interview of the study's purpose, what participation involves, and that participation is voluntary and that confidentiality will be offered. In the invitation emails sent out to potential interview candidates, they were informed of the purpose of the interviews and that their participation would be of great value for this research, in order to motivate them. Furthermore, at the start of each interview, the interviewees were offered confidentiality. Patel and Davidson (2003) also recommend using this type of approach, because interviewees don't always see a purpose or value for them in participating in interviews and need to be motivated to participate.

During these initial interviews, several new potential interview candidates were recommended by the interviewees. These recommended candidates were afterwards contacted with an interview invitation. In total, 9 interview invites were sent out, of which 8 were accepted. In one case, one of the accepted interviewees invited one of their colleagues to participate as well. Bryman and Bell (2007) describe this sampling strategy of recommendation as snowball sampling. Through this strategy, several highly relevant interview candidates, who had worked with the specific interview topic, could be sourced.

4.1.1.2 Data Collection through Interviews

An interview framework was created to guide the interviews, but the interviews did not strictly follow the framework. The intention was to have semi-structured interviews, with the purpose to guide the interviews in the right direction by having a set of questions, but at the same time allow for the interviewees to be able to expand their answers as they deemed necessary. This would allow for greater generality, richer and more detailed answers and finding out what the interviewee finds as most important (Bryman and Bell, 2007). As the purpose of the interviews is to create understanding, this approach was found to be the most viable. This approach is confirmed as advantageous by Patel and Davidson (2003), who mention that low structure and low standardisation of the interview is preferable for a qualitative based study with the purpose to explore and identify attributes in a research topic.

The interview framework was developed with foundation in theory for business model creation. The questions of the framework were designed to understand the topic of distributed cloud and were around the key areas of value creation, value capture and value delivery. In total there were approximately 20 questions in the interview framework, divided under the subheadings of "Drivers", "General Moderators", "Ericsson Specific Moderators" and "Outcomes". In the case of the interview on the topic of internet of things, the questions were adjusted to fit this purpose. Before each interview, the interview framework was, if deemed necessary, adjusted through addition, deletion or alteration of the frameworks' question to better fit the interviewee's background. Moreover, the framework was also altered when new insights were gained from previous interviews. See Appendix A for the interview frameworks.

Interviews were conducted primarily face-to-face whenever possible. Seven out of eight interviews were conducted face-to-face, with the remaining conducted through use of Skype, due to large geographical distance. There was variation in the length of the interviews, with all of them being in the range of 30-60 minutes. Furthermore, all the interviews were conducted in English, as that is the official Ericsson AB language.

In total, nine different Ericsson employees were interviewed in eight interviews. Interview 3 had two interviewees present, while the rest of the interviews had only one interviewee present. Table 3.1 shows a brief description of the interviews held and the broad range of backgrounds interviewed to create a clearer understanding of the context.

Table 4.1
List of Interview Dates and Interviewees' Background

Interview Number	Interview Date	Interviewee Background
1	2018-02-13	Distributed Cloud: Engineering
2	2018-02-15	Distributed Cloud: Engineering
3	2018-02-20	Internet of Things: Management
4	2018-02-20	General: Marketing
5	2018-02-21	Distributed Cloud: Management
6	2018-02-22	Distributed Cloud: Management
7	2018-02-23	General: Management
8	2018-02-27	Distributed Cloud: Management

4.1.2 Interview Analysis

Analysing the interview data was conducted with the purpose of extracting interesting findings and themes that can be used for the creation of a business model framework. For this purpose, a process of thematic coding and categorising of the data was used. Interview data that was in some way found interesting stated as important by the interviewee or thought of as relevant for the research topic was marked in the transcripts. The marked quotes were thereafter grouped together in different groups based on common elements of the data. From the coded interview data, a theme was identified for each group. The different themes pertained to both Ericsson's specific positioning in the market and various topics related to

business models development for distributed cloud. The seven main themes were labelled as the definition of distributed cloud, ecosystem structure, value added, competition, customers, offering and challenges.

During the analysis of the interview data, it became evident that the interviewees' answers about the different themes could be interpreted from two main perspectives. An interpretation was made that the interviewees had either a traditional or alternative view on the different themes. For the purpose of capturing this in the empirical analysis, the extracted quotes were grouped in a first and second order category, representing a traditional or alternative view. In the following text, the seven different themes will be described from the two different perspectives of traditional and alternative views, using the interview data as a source.

4.1.2.1 Theme – Distributed Cloud Definition

One of the core questions in the interview framework was the question about what the definition of distributed cloud is. In this case, there was no consensus or exact answer among the interviewees. They all had their individual definition of what distributed cloud is. The main finding was that some defined it as a number of data centres, while some defined it as a tool for resource allocation. These two have been interpreted and labelled as the traditional and the alternative view of the distributed cloud definition.

From a traditional perspective, several answers pointed towards the definition of distributed cloud being associated with the number of data centre in a particular region. One interviewee said that

> *"Currently, I think most of the distributed cloud discussion is our traditional, container based. It would be like a number of data centres, small, as of less than hundred servers."* (Interview 8)

A second interviewee mentions that

> *"Distributed cloud is a couple of data centres per nation."* (Interview 2)

Another interviewee reiterates this point

> *"In a true distributed environment; you are going to have at least tens of sites per country."* (Interview 5)

From an alternative perspective, most of the discussion was about distributed cloud being a tool for resource allocation. One interviewee described this as connecting to a portal that decides where you connect. The interviewee said

> *"With the distributed cloud, you connect to the cloud and you will end up somewhere. You connect to what I imagine like a portal. How they assign you to find what you are looking for or were you connect, that's up to them."* (Interview 1)

Another interviewee builds on this perspective by describing the process

> *"Place applications, or workloads as they are called, where they make the most sense, depending on the use case and depending on economy."* (Interview 4)

4.1.2.2 Theme – Ecosystem Structure

The second theme regarded the importance of an ecosystem for a distributed cloud solution. All interviewees agreed that an ecosystem will be of great importance. The main differentiation factor between their answers regarded what role Ericsson would take in this ecosystem. Most of the interviewees wanted a partnership solution. The other viewpoint was that Ericsson would create a multi-sided business model and act as an aggregator.

From a traditional perspective, the interviewees talked about partnership as the most important aspect. They mentioned that Ericsson needs to establish a partnership for this emerging technology

> *"I think this is an ecosystem play for sure […] Working with partners and potential customers together, as early as possible, is very crucial."* (Interview 6)

Another interviewee mentioned that industry partnerships are common for cloud technology

> *"When you come into the cloud space in general, you have to have ecosystem thinking. There are a lot of industry partnerships."* (Interview 4)

From an alternative perspective, the main insight was that Ericsson should take an aggregator role in the ecosystem, through the use of a multi-sided transactional business model. An interviewee mentioned that

> *"I'm personally thinking of some kind of multi-sided transactional business model. In order to get away from the initial complex of the 1% as I spoke about. If you want to break that you need to, in some way, tie directly into those who pay […] Because now we will ensure that we will aggregate developers on the other side of that that want to place the workload on to you."* (Interview 8)

4.1.2.3 Theme – Value Added

The third theme the interviewees discussed was the way distributed cloud could offer value to customers. Everyone agreed that distributed cloud has value to offer to customer, but the interviewees talked about the valued offered in different ways. Some talked of distributed cloud as a technology which had value of its own, while other referred to it as an enabler for other applications.

From a traditional perspective, distributed cloud has several properties that could potentially add value. Some of these include low latency and savings of resources. One interviewee mentioned that

> *"Then compared to a centralised cloud, the distribute is supposed to offer more superior services in terms of lower latency and moving data further out in the network, saving resources in terms of network transport higher up in the network."* (Interview 2)

From an alternative perspective, interviewees meant that distributed cloud has little value on its own, but allows other applications to run on it, which would create value. An interviewee mentioned that

> *"Enabler, I don't believe that there's a business at itself."* (Interview 7)

This argument was reiterated by another interviewee, who mentioned that

"A cloud is always for other services." (Interview 8)

4.1.2.4 Theme – Competition

Another highly discussed theme was that of competition. Interviewees agreed that there is fierce competition in this sector. Some named traditional telecom vendors as the main competitors, while other talked of newer players in the sector as the real competitors.

From a traditional perspective, interviewees saw traditional telecom vendors such as Huawei and Nokia as the main competitors. One answer included

> "*We have the classic ones and that's the traditional telco vendors like Huawei and Nokia."* (Interview 6)

Another interviewee had a similar answer

> *"Well of course the traditional. We have Nokia and Huawei in the network's area."* (Interview 7)

From an alternative perspective, the interviewees saw new players in the sector such as Amazon and Microsoft as competitors

> *"Most people are using Amazon, Google or Microsoft Azure or other cloud providers."* (Interview 1)

Another interviewee mentioned Ericsson's customers as potential competitors

> *"Now the competitors are also our customers [...] One example is mobile edge X."* (Interview 5)

4.1.2.5 Theme – Customers

Similar to the discussion of competitors, customers are divided into two categories, telecom operators and new customers.

From a traditional perspective, the main customers for distributed cloud will be those who have always been Ericsson's customers, the telecom operators. One interviewee mentions that

> *"It will be the telecom operators we are addressing today. Mostly the big ones, but also smaller ones around the world."* (Interview 4)

Another interviewee mentions that it is Ericsson's strategy to sell to telecom operators

> *"Our main customers are the operators and that is a corporate strategy ceiling."* (Interview 5)

From an alternative perspective, Ericsson would move away from telecom operators and instead offer distributed cloud to industry applications. One interviewee describes this as

> *"Now we are supposed to serve all kinds of industries and 5G and distributed cloud will be just one little part of their big ecosystem."* (Interview 2)

4.1.2.6 Theme – Offering

On the discussion of whether Ericsson's offering should consist of mainly hardware or software, interviewees agreed that hardware is a low margin business. Furthermore, they

mentioned that Ericsson has been a primarily a hardware company, but should move towards a software offering.

From a traditional perspective, Ericsson has been offering hardware components. An interviewee said that

> *"Ericsson has been a box company, selling hardware for a lot of money and almost giving the software for free."* (interview 1)

From an alternative perspective, the interviewees mentioned that Ericsson's focus should be on moving towards a software offering, as hardware is connected to a very low margin. One interviewee mentioned that

> *"Then if you judge the market situations, hardware is connected to very low margin and therefore everyone wants to work with software […] We want to be a software company and offer services related software."* (Interview 6)

Another interviewee mentioned that a software platform would be the right option

> *"I think we will need to be somewhere in the middle, where we provide certain sort of software platform infrastructure."* (Interview 2)

4.1.2.7 Theme – Challenges

The interviewees saw several challenges with distributed cloud. Some mentioned that it would be difficult to offer something that would create customer value. Other mentioned strong competition in the sector and meant that the biggest challenge would be to capture the customer value in such a competitive environment.

From a traditional perspective, the discussion centred on understanding the customer in order to create value for them. An interviewee described the challenge as

> *"One thing is, of course, what is the real value that you give to the customer."* (Interview 7)

Another interviewee described this as

> *"We have to be very clear on what is required from end users."* (Interview 4)

From an alternative perspective, the challenges are that the sector is highly competitive and Ericsson would need to build a brand name, sales contact and customer relations in this field. An interviewee described it as

> *"It will be a challenge to enter these different new ecosystems. Because we don't have the sales contacts and the customer relations, and we don't fully understand their problems."* (Interview 2)

Another interviewee described the concept in a similar way

> *"We have almost no credibility yet in the cloud areas at all."* (Interview 1)

Table 4.2
Summary of Themes Distinguished between a Traditional and Alternative Perspective

Theme	Traditional Perspective	Alternative Perspective
Distributed cloud definition	**Quantity of data centres** "Currently, I think most of the distributed cloud discussion is our traditional, container based. It would be like a number of data centres, small, as of less than hundred servers." (Interview 8) "Distributed cloud is a couple of data centres per nation." (Interview 2) "In a true distributed environment; you are going to have at least tens of sites per country." (Interview 5)	**Resource allocation mechanism** "With the distributed cloud, you connect to the cloud and you will end up somewhere. You connect to what I imagine like a portal. How they assign you to find what you are looking for or were you connect, that's up to them." (Interview 1) "Place applications, or workloads as they are called, where they make the most sense, depending on the use case and depending on economy." (Interview 4)
Ecosystem structure	**Partnership** "When you come into the cloud space in general, you have to have ecosystem thinking. There are a lot of industry partnerships." (Interview 4) "I think this is an ecosystem play for sure […] Working with partners and potential customers together, as early as possible, is very crucial." (Interview 6)	**Multi-sided model** "I'm personally thinking of some kind of multi-sided transactional business model. In order to get away from the initial complex of the 1% as I spoke about. If you want to break that you need to, in some way, tie directly into those who pay […] Because now we will ensure that we will aggregate developers on the other side of that that want to place the workload on to you. (Interview 8)
Value added	**Value on its own** "Then compared to a centralised cloud, the distribute is supposed to offer more superior services in terms of lower latency and moving data further out in the network, saving resources in terms of network transport higher up in the network." (Interview 2)	**Value as an enabler** "Enabler, I don't believe that there's a business at itself." (Interview 7) "A cloud is always for other services." (Interview 8)
Competition	**Telecom vendors** "We have the classic ones and that's the traditional telco vendors like Huawei and Nokia." (Interview 6) "Well of course the traditional. We have Nokia and Huawei in the network's area." (Interview 7)	**New players** "Most people are using Amazon, Google or Microsoft Azure or other cloud providers." (Interview 1) "Now the competitors are also our customers [...] One example is mobile edge X." (Interview 5)

Table 4.2
Continued

Theme	Traditional Perspective	Alternative Perspective
Customers	**Telecom operators** "It will be the telecom operators we are addressing today. Mostly the big ones, but also smaller ones around the world." (Interview 4) "Our main customers are the operators and that is a corporate strategy ceiling." (Interview 5)	**New customers** "Now we are supposed to serve all kinds of industries and 5G and distributed cloud will be just one little part of their big ecosystem." (Interview 2)
Offering	**Hardware** "Ericsson has been a box company, selling hardware for a lot of money and almost giving the software for free." (Interview 1)	**Software and services** "Then if you judge the market situations, hardware is connected to very low margin and therefor everyone wants to work with software […] We want to be a software company and offer services related software." (Interview 6) "I think we will need to be somewhere in the middle, where we provide certain sort of software platform infrastructure." (Interview 2)
Challenges	**Creating customer value** **"**One thing is, of course, what is the real value that you give to the customer." (Interview 7) "We have to be very clear on what is required from end users." (Interview 4)	**Capturing customer value** "It will be a challenge to enter these different new ecosystems. Because we don't have the sales contacts and the customer relations, and we don't fully understand their problems." (Interview 2) We have almost no credibility yet in the cloud areas at all." (Interview 1)

4.2 Business Model Framework Creation

This section explains how the questions for the crowdsourcing initiative were formulated, i.e., how the business model framework was created. The process can be divided into three different phases, i.e., knowledge gathering, framework creation and framework evaluation. The first phase has already been explained and thus, this section will explain the other two steps of framework creation and evaluation.

4.2.1 Framework Creation

The creation of this framework was based on a number of different requirements. The created framework had to capture the essence of a business model. At the same time, the framework needed to be adapted to fit the crowdsourcing platform to be used, putting requirements on how extensive the framework could be and how its visual representation and formulation. The framework also needed to be functioning for the intended context of distributed cloud. Being a new technology, the framework needed to capture future aspects of importance that are prominent in a world of the Internet of Things. Albeit the definition of a business model varies across literature, Foss and Saebi (2017) explain that the three components of value capturing, value delivering, and value creation are general for most theory on business models. Therefore, these three components were chosen to be included in the constructed framework.

Whilst constructing the framework, St. Gallen's magic triangle was chosen to be the basis for developing the new framework. The choice stood between Osterwalder and Pigneur's business model canvas and St. Gallen's magic triangle. As mentioned in the theoretical framework, St. Gallen's magic triangle is simpler and better to use in a workshop setting (Bilgeri et al., 2015). Additionally, as the crowdsourcing platform had limitation where a more extensive model did not fit, St. Gallen's magic triangle was deemed superior for this case. However, some modifications were made to St. Gallen's magic triangle based on data presented in the literature chapter and the collected interview data. These modifications will be further discussed under the following three headings of value creation, value capturing and value delivery.

4.2.1.1 Value Creation

Value creation is a central part in Osterwalder and Pigneur's business model canvas (Osterwalder and Pigneur, 2010). Located in the middle of the framework is the value proposition, i.e., a description of a customer need that is satisfied. Other components that are related to value proposition are: customer segments, channels and customer relationships (Osterwalder and Pigneur, 2010).

In St. Gallen's magic triangle, value creation is mentioned in two components, i.e., who and what. *Who* explains key customers and *What* explains the customer value and what it is that is actually offered to the customer (Bilgeri et al., 2015). Concerning value creation, Bilgeri et al. (2015) also mention that for Internet of Things business models, value creation must be included for the whole ecosystem, and not only for the focal firm.

The importance of ecosystem thinking was also clear from the interview data. All interviewees agreed upon the importance of ecosystem thinking for distributed cloud. One interviewee said: "I think this is an ecosystem play for sure […] Working with partners and potential customers together, as early as possible, is very crucial." (Interview 6). Another one said: "I'm personally thinking of some kind of multi-sided transactional business model. […]" (Interview 8).

As both the literature and the empirical data spoke of the importance of an ecosystem, the ecosystem view was determined to be important and was therefore included in the framework under the question named *What*. The resulted component was named *What* and had the

following description: *What is the value proposition(s) behind this application, i.e., how should customer value be (co)created from the specific application?*

St. Gallen's magic triangle also includes a component called *Who*. This component, in similarity to customer segments and customer relations in the business model canvas, describes the target customers and customer segments (Osterwalder and Pigneur, 2010; Bilgeri et al., 2015). As can be seen in the interview data, varying views exist on customers and customer segments, see table 4.2. Ericsson also mentions customer focus as an important area and hence the *Who* question was presented in the constructed framework with the following description: *Who are the main stakeholder (e.g., customer, partners or complementors)?* What can be seen from the formulation is the continued importance of an ecosystem view, where not only the customers are asked for, but also other important stakeholders.

Due to limitations in the crowdsourcing platform, the channels component was not included directly, as it was also deemed to be of less importance than the other chosen components.

4.2.1.2 Value Capturing

Value capturing is in Osterwalder and Pigneur's business model canvas represented under two components, i.e., cost structure and revenue stream. These two components relate to the costs behind a business model and how to generate profit from it (Osterwalder and Pigneur, 2010). In St. Gallen's magic triangle, these two components are grouped together into one component called *Value* (Bilgeri et al., 2015). Bilgeri et al. (2015) also mention that in an Internet of Things business model, it is important to have a sustainable ecosystem where everybody has incentive and motivation to contribute.

The interview data had little to add under this topic. Albeit everyone was asked for how to monetise distributed cloud, no one could provide a clear answer. Referring to the research setting, Ericsson is not sure about how to monetise distributed cloud and this is an important question for them. Therefore, the questions were deemed important to include in the constructed framework, and the component became: *What are the revenue sources for different actors*?

Cost was hence not included. This was the result of discussions with experts and the fact that cost was interpreted as less important from the interviews, as it was not mentioned in any large degree. Noticeable is also the fact that revenue sources are asked to be explained from different actors. This is once again a reflection of the ecosystem thinking that permeate the whole framework.

4.2.1.3 Value Delivering

Value delivery is indirectly mentioned under both St. Gallen's magic triangle, in the form of the component *How*, and in Osterwalder and Pigneur's business model canvas, as key partners, key activities and key resources (Osterwalder and Pigneur, 2010; Bilgeri et al., 2015). Bilgeri et al. (2015) further state that the traditional linear relationships between supplier, focal company and end customer fails to capture the value added.

Explaining and visualising the ecosystem is a natural part to include, since an ecosystem view is argued to be of importance. Which party is responsible for what in the ecosystem and how

are they connected in an ecosystem are two important questions to answer. Therefore, the component *How* was included in the constructed framework as: *How is the value proposition created, i.e., how does the value chain look like, and who is taking which role in the ecosystem?*

4.2.1.4 Business Opportunity and Context

Bilgeri et al. (2015) argue that due to the huge increase in connected devices as a result from the Internet of Things, a great opportunity for companies is to leverage the data. The interview data also show a shifting view of the purpose of distributed cloud. One person said: "A cloud is always for other services" (interview 8). Some people regarded distributed cloud primarily as an enabler for other services, whilst other as a business on its own. Therefore, St. Gallen's framework was extended with another component, called: *Context- How can further business cases be enabled based on this application?* Thus, this component aims to capture business models where distributed cloud's primary function is to be an enabler for other services, and how to leverage the data.

As can be seen from the interview data, see Table 4.2, the interviewees interpreted distributed cloud differently. A traditional perspective and an alternative perspective were identified. The business models may end up significantly different depending on which perspective an author has in the crowdsourcing initiative. Also, whilst co-creating business models in a crowdsourcing setting, a common understanding of distributed cloud could be of importance. Therefore, another category was added to St. Gallen's magic triangle, called: *Business opportunity- Please explain a potential new business opportunity of Ericsson's distributed cloud.*

4.2.1.5 The Framework

The created framework ended up looking as follows

Business opportunity

- Please explain a potential new business opportunity of Ericsson's distributed cloud.

What

- What is the value proposition(s) behind this application, i.e., how should customer value be (co)created from the specific application?

How

- How is the value proposition created, i.e., how does the value chain look, and who is taking which role in the ecosystem?

Who

- Who are the main stakeholder (e.g. customers, partners etc.)?

Value

- What are the revenue sources for different stakeholders?

Context

- How can further business cases be enabled based on this application?

4.2.2 Framework Validation

After the framework was created, some steps were taken to validate it. This included sending the framework to several experts on the topic of business models. This step was taken to validate if the framework was anchored with in theory and that it captured the essence of what a business model is. Another step of validation was to test the framework through a small-scale pilot study. This step was taken to test how well the framework worked with the crowdsourcing platform that it was intended for. The evaluation and its results will be further analysed during the next two headings called validation by experts, and validation through pilot study.

4.2.2.1 Validation by Experts

The framework was sent to three experts on business models, based at Ericsson Research in Stockholm. It was also sent to a few experts within the field of business models. The feedback can be viewed in table 4.3

Table 4.3
Expert Feedback

Expert	Feedback
Expert 1 (Senior researcher)	"I remember at the time when the term cloud was at hype everything was called cloud. The distributed cloud can also mean different thing for different people. For example, it could be distributed ladder like blockchain or edge computing, then the value proposition is quite different. Thus, I think it is important to clearly establish during interview what type of distributed cloud the interviewer is talking about. I agree that value proposition of distributed cloud is mostly towards enabling others in the value chain. So, I think it would be very valuable to learn people's perspective on what use cases and business models could be enabled by the distributed cloud."
Expert 2 (Principal Researcher Business Models)	"I think it is important to put emphasis of two aspects that are only implicit in the described framework- Pain Points/Jobs-to-be-done and Unique Values. My experience working with product developer tells me that it is very easy to forget the pain points/jobs-to-be-done when a value proposition is developed which means that the value proposition doesn't solve a real problem and we have a product that solves a problem that doesn't exist. By using an outcome, or even better, a Job-to-be-done/pain approach the chances for a successful value proposition increases – If we understand the job that the customer's trying to do and then develop a product that nails this job perfectly, the probability that your innovation will be successful is improved in dramatic ways (Christensen, 2016). The second aspect is the unique values of the proposed value proposition – Our offerings always have to be compared to competing alternatives (second best alternatives) helping us to understand who we compete against from the customer's perspective and how to make our offering unique. Once we have identified unique values of our offering then we need to quantify the additional value our offering can give the customer. With this in mind, we have a good base to decide on a revenue model to capture these values."
Expert 3 (Research Manager)	"All in all, I agree with what both expert 1 and 2 have commented on. Besides those comments I would put a bit more focus on the customer and the customer's profile in the questions. In Ericsson we have a tendency to say that we fully understand the customers and their pains, however when you start to scratch the surface we are very much inside/out focused, i.e. technology push, telling the customer what they need etc. Thus, from my perspective it would be of great value if we could understand a bit more how mature these crowdsourced business models are in terms of in-depth customer understanding, i.e. an indication of the validity. A question (what expert 2 proposed) related to pain points/job-to-be-done would at least give us a hint."

4.2.2.2 Validation through Pilot Study

A small scale pilot study was conducted with the framework in the crowdsourcing platform, as a next step of validation. Five people were invited to participate in the pilot study. These were sampled from the set of previous interviews, based on expressed interest and knowledge about the topic. Out of these five people, three accepted the invitation to participate in the study. These three were then given three days to provide answers to the framework and afterwards provide feedback on it. After three days, one person had managed to answer the questions. Even though only one person had answered the question, all three were asked to provide some open comments regarding the questions and the platform. Only the participant (a distributed cloud engineer) in the pilot study provided feedback. The engineers' answers can be seen in the table 4.4.

Table 4.4
Feedback from Pilot Study

Participants	Comments on Platform	Comments on Question
Distributed Cloud Engineer	"It would have been nice to be able to correct an old submission. I tried to do it but my correction ended up as a new edit. It also seems like there is a maximum of one edit that can be made to a submission. I also tried to make a second new submission but the system didn't accept it as it thought it was too similar to my first submission. It suggested my new submission would be an edit of my first submission instead (but I had already maxed out number of edits..). So in the end I did not manage to submit my second submission. I tried rewriting but it was still too similar to my first submission."	"The question was very broad (with many potential answers) and perhaps it would be more fruitful with a more narrow scope to the question and instead have more questions"

4.2.2.3 Changes to the Framework

The changed made in the framework were based on the feedback received from the experts, as seen in table 4.3. Furthermore, changes were made with regards to discussion with experts, comments from the person responsible for the crowdsourcing platform and feedback received from the pilot study, see table 4.4

The first changed that was made was to remove the first component, i.e., business opportunity. This was due to feedback indicating an overlap of the questions. The aim of the question, to clarify the author's view of distributed cloud, was assumed to still be captured in the answers of the remaining questions.

Another big change was to abandon the layout which was based on St. Gallen's magic triangle. Due to feedback from the person responsible of the crowdsourcing platform, six components were explained to be too many. Instead, the existing components were grouped into three different categories, leaving more space for the participants to explain their thoughts. The three new headings became value creation, value capturing and ecosystem.

Value creation incorporates the previous *What* and *Who* components. The question related to the previous component *What* was also re-formulated due to the feedback received by the experts, i.e., that a crystal-clear problem which distributed cloud will resolve for the customer, is needed. The new formulation is based on the questions formulated by Sinfield et al. (2012), i.e., Who are the target customers/users of our distributed cloud solution? What need is met for the customer? What offering will we provide to address that need?

Value capturing includes the previous components called *Value* and *Context*. The major feedback received on these components were that these questions may be too difficult for participants to answer and that the source of revenue should be clearly focused on Ericsson's perspective. Hence, changes were made and the final component included the following question that is based on the question from Sinfield et al. (2012), i.e., how will our business earn a profit? This question is regarded to include the previous component of context. When asking for profit, not only direct sources of revenue may be included, but also indirect sources such as opportunities for leveraging data.

Ecosystem is the final component and involves the previous component called *How*. The questions within the component were reformulated in accordance to the questions written by Sinfield et al. (2012) but include the same aspects and fulfil the same goals as the previous version. The questions became the following after the changes: What role will our business play in providing the offering? What role must be played by complementors and partners in the ecosystem? How can we get the complementors on board?

4.2.3 The Complete Version of the Business Model Framework

This section will present the final version of the business model framework, which incorporates changes based on the feedback from the pilot study and experts. This business model framework will be used in the crowdsourcing initiative.

VALUE CREATION:
Who are the target customers/users of our Distributed Cloud solution? What need is met for the customer? What offering will we provide to address that need?

VALUE CAPTURING:
How will our business earn a profit?

ECOSYSTEM:
What role will our business play in providing the offering? What role must be played by complementors and partners in the ecosystem? How can we get the complementors on board?

5 Invitation to the Crowdsourcing Initiative

With the completed business model framework, the invitation process could begin. This process was divided into several different parts. To answer the research question of what variables affect the participation rate in a crowdsourcing initiative, several hypotheses and treatments were established. The purpose of this step was two-fold. First, to evaluate what type of variables affect invited participants' willingness to participate in this type of activity. The second purpose was to attract participants to share their ideas in the crowdsourcing activity. This chapter begins with describing the established hypotheses and treatments used to evaluate the participation rate. Next, the sampling section describes how participants were chosen and invited. Afterwards, an analysis of the collected data is presented.

5.1 Hypotheses

For this part of the research project, a set of hypotheses were created. These hypotheses were based on literature about crowdsourcing and social movement and activism presented in chapter 2. Some researchers have pointed out a positive effect of monetary incentives and recognition on motivation (e.g., Bonabeau, 2009; Simula and Vouri, 2012; Skopik et al., 2012). Hence, the following hypotheses were formulated:

H1 A, B: Presence of a) monetary incentives and b) recognition incentives increases the participation rate in crowdsourcing.

Zald and Berger (1978) argue that participation increases if an independent base is provided. They further argue that criticality will also increase participation. Briscoe and Gupta (2016) mention that less dependency will increase the participation in social movements. Independence and criticality are in many cases correlated and hard to separate, whereas the following hypothesis was formulated based on non-conformity, which is the sum of independence and criticality:

H2: The higher the perceived non-conformity (independence and criticality), the higher the participation in crowdsourcing.

There exists limited amount of theory related to the interplay between monetary incentives and non-conformity. However, Briscoe and Gupta (2016) mention that dependencies are likely to decrease participation. The non-conformity can be seen as a dependency when combined with monetary incentive. Hence, the following hypothesis was formulated:

*H3: The presence of a moderator effect of non-conformity * monetary incentives decreases participation in crowdsourcing.*

5.2 Treatments

To evaluate the established hypotheses, a set of treatments were created. These treatments were textually small changes in the body of the invitation email. The treatments were ordered in a 3-step hierarchy. The first treatment of independence had two options, the second treatment of criticality also had two options and the third treatment of incentives had three options. This in turn allowed for 12 different combinations of the invitation email. See

Appendix B for the 12 different invitation emails. An invitation letter was created with general information such as the background of the initiative, an attached instructional video of how to use the CoDigital platform and a link to sign up for the initiative. The independence treatment had the option of either high independence or low independence, see table 5.1.

Table 5.1
Independence Treatment

Independence	Changes in Invitation Email
High Independence	**We passionately believe in the value of** increased inclusivity and transparency in strategy making processes and **committed to** the realization of open approaches to strategy making.
Low Independence	No text included

The criticality treatment also had two different versions, supportive or critical as shown in table 5.2.

Table 5.2
Criticality Treatment

Criticality	Changes in Invitation Email
Critical	In a digital era, many aspects of our strategy processes **will lose their value and must be overturned** considering the emerging possibilities and requirements. Hence, we pursue a **critical approach** towards the dominant assumptions and processes of strategizing in our company.
Supportive	In a digital era, many aspects of our strategy processes **will retain their value but can be improved** considering the emerging possibilities and requirements. Hence, we pursue a **supportive approach** towards dominant assumptions and processes of strategizing in our company.

The third treatment of incentive had three options, no incentive, recognition incentive or monetary incentive as seen in table 5.3.

Table 5.3
Incentive Treatment

Incentive	Changes in Invitation Email
No Incentive	The outcomes will be evaluated by experts and the **best three** contributions will be selected and announced during May, 2018.
Recognition	The outcomes will be evaluated by experts and the **best three** contributions will be selected and announced during May, 2018. The best ideas will **receive a recognition letter that will be communicated to senior managers.**
Monetary	The outcomes will be evaluated by experts and the **best three** contributions will be selected and announced during May, 2018. The best ideas will be **rewarded with vouchers** (which in total amount to USD 3500).

5.3 Sampling

For the purpose of sampling participants, an internal excel list of all Ericsson's employees was reviewed. This list included attributes such as name, email, geographic location of office, department, tenure and title. The inclusion criterion was set to include all employees whose title implied that they had direct customer contact. The choice to include only employees with direct customer contact was because these are the employees who, because of their frequent interaction with Ericsson's customers, would have most knowledge about answering the question of how to create most value for customers.

For this research project, it was estimated that at least 200 participants in the crowdsourcing activity would be considered a sufficient database to be able to successfully draw statistical conclusions. With this in mind, a first set of 4469 employees were filtered out. The final amount of invitation was subject to change depending on if the target of 200 participants had been reached. After the initial 4469 invitations had been sent out, it was shortly after decided to invite another 3192 participants to the initiative for a total set of 7661 invitations sent out. The total set of employees included those with one of the following titles; Account Manager, Commercial Manager, Customer Operations Manager, General Sales Management, Key Account Manager, Manager Service Delivery, Service Deliver Management, Service Delivery Manager, Service Project Manager, Technology and Information Manager.

Once the sample of employees to invite had been set, their order in the list was randomised and divided into 12 groups. For the purpose of statistically analysing the treatments, the set of 7661 employees were randomly ordered and divided into 12 different groups, representing each of the 12 combinations of treatments they would receive in the invitation email. Through the mailings function in Microsoft Word, personalised emails were sent out. Each email included the employee's first name in the greeting, as this was considered to catch the reader's attention. Other things included in the email were a link to a short video, explaining the functionality of the crowdsourcing platform CoDigital.

5.4 Web Poll

An internal Ericsson web poll was created. The purpose of the web poll was two-fold. First, it allowed the participants to sign up for the initiative. Second, the web-poll collected data through a series of questions, which would later be analysed to see if the participants had correctly understood the treatments they had received, as a validity check. A link to the web poll was attached to the invitation email. The web poll included 5 questions and was open for 12 days. The first question asked the participant to write in their email as a confirmation for wanting to sign up for the initiative. The following question related to the treatment with the purpose to collect data of whether the participants had correctly interpreted the different treatments, as a validation check that would later be analysed. The first of these questions was "Which of the following incentives capture your attention in our invitation letter". The possible answers to this question were "None of the above", "Recognition" or "Monetary reward". The next question was an open text questions, where the participants could optionally share their comments on the initiative. The question was "(Optional) Please, share why would you like to participate in this initiative". Participants could answer this question with a no-limit textual answer.

5.5 Participation Rate Analysis

Binomial logistic regression was used to evaluate whether the participation rate was affected by any of the implemented treatments. For this purpose, the statistical package SPSS was used. The choice of logistic regression falls on that the dependent variable of acceptance is not continuous, but a binary variable, either one accepts to participate or not.

A list of participants was extracted from an excel file that was generated with the answers to the web poll. After filtering out undeliverable invitation emails from the total population and other invalid submissions, (not invited people signing up for the initiative) a sample of 309 participants could be considered valid from a total invited population of 3882 people or a 7.9% acceptance rate. The 10 different titles were grouped in three job units, namely service, sales or other. The "service" job unit consisted of the titles of Manager Service Delivery, Service Delivery Management, Service Delivery Manager and Service Project Manager. The "sales" job unit consisted of those with the title of Account Manager, General Sales Management and Key Account Manager. The last three titles of Commercial Manager, Customer Operations Manager and Technology and Information Manager was grouped in the "other" category. The highest represented category of the three was services with 242 or 78.3% of the participants, followed by sales with 47 or 15.2 % and other with 20 or 6.5%. Furthermore, the participants had either the role of manager or employee, where employees accounted for 158 of the participants, or 51.1%, and the managers for 151 of the participants, or 48.9%. The average tenure for the participants was 8.5 years with a standard deviation of 3.0 years. The participants came from 11 different geographical regions which were defined by Ericsson, as shown by table 5.4.

Table 5.4
Participant Distribution by Region

Region	Participants	As of Total
RINA	84	27.2%
RNEA	41	13.3%
RWCE	38	12.3%
RMED	35	11.3%
RNAM	28	9.0%
RLAM	25	8.1%
RMEA	16	5.2%
RSSA	15	4.9%
RASO	11	3.6%
Sweden	8	2.6%
RECA	8	2.6%

An analysis was conducted to assess whether the participants had correctly understood the different treatments. Using the answers from the web poll, independent T-tests were conducted to compare the means of the answers in the web poll and the treatments the participants had received. Comparing the web poll answer of "Which of the following incentives capture your attention in our invitation letter" with those who had received the monetary reward treatment, showed that there was a significant ($p < 0.01$) difference in the mean between those who had reported that they had seen monetary reward and received a monetary reward treatment, as compared to those who had not seen a monetary reward in the invitation email and not received a monetary reward treatment. The T-statistics for this test showed -3.323.

The same analysis was conducted for the criticality and independence variables. In this case, the answers of the optional comments were coded. Answers which had shown appreciation for open strategy or new ways of strategising were coded as "1" for having identified the independence treatment, while no such indication received the code "0". The mean of these answers was compared to the mean of those who had received an independence treatment, and this showed that there was a significant ($p < 0.05$) difference in the mean, showing that the participants had correctly understood the independence treatment. The T-statistics for this was -2.499. Separately, answers who had expressed criticality or a need for organisational change were coded as "1", while those who had not were coded as "0". These answers were compared to those who had received the criticality treatment, where the T-test showed that there was a significant ($p < 0.01$) difference in the means, meaning that they had correctly understood the treatments. The T-statistics for this test was -2.805.

A correlation matrix, as well as descriptive statistics, was generated for the different variables, as shown in table 5.5. Five hierarchical binomial logistic regression models were created to test the established hypotheses, as seen in table 5.6. The first binomial logistic regression model included only the dependent variable of acceptance and tested it against control variables. The control variables were Tenure (a scale variable and measured in years),

Manager (nominal variable), Job Unit Service (nominal variable), Job Unit Sales (nominal variable), and several Region dummy variables (nominal variables). The second model tested the effect of the independent variables. Because of high correlation between criticality and independence, these two variables were combined to create a new variable called non-conformity, which was the sum of the values of the independence variable and the criticality variable. The independent variables were Non-conformity (a scale variable, the sum of independence and criticality), recognition (nominal variable) and monetary (nominal variable). Besides the independent variables, the model also included the control variables, as in the first model. The third model added the first moderator variable of Non-conformity * Recognition (nominal variable, the product of Non-conformity and Recognition), to test the interaction effect of these variables. In the fourth model, the second moderator variable of Non-conformity * Monetary (nominal variable, the product of Non-conformity and Monetary) was added, again with the purpose to analyse the interaction effect.

Model 1 shows the effect of the control variables on the dependent variable of acceptance. The model shows that being a part of the sales unit has a significant negative effect (β=-0.779. $p < 0.01$) on the acceptance variable. Additionally, people being in the region RASO have a significant negative effect (β=-1.017 $p < 0.05$) on the variable acceptance. Similarly, people being in the region of RNAM (β=-0.835, $p < 0.10$) have a significant negative effect on participations, as well as people being in the region Sweden (β=-1.332 $p < 0.05$) have a significant negative effect on acceptance.

Model 2 shows interesting effects of the independent variables of Non-Conformity, Recognition and Monetary. Participants who had received the monetary treatment had a significant positive effect (β=0.294, $p < 0.05$) on the variable acceptance. This supports hypnotises 1A, which mentions that the presence of monetary incentives increases the participation rate in crowdsourcing. Meanwhile, the Recognition variable has a negative, but insignificant effect on acceptance. Therefore, hypotheses 1B, which mentions that presence of recognition incentives increases the participation rate in crowdsourcing, cannot be supported.

In model 3, the moderator variable of Non-conformity * Recognition is added. Again, there is no significant effect on the Recognition variable, i.e., hypotheses 1B cannot be supported.

Model 4 replaces the moderator variable of Non-conformity * Recognition with Non-conformity * Monetary. In this model, it becomes clear that the Non-conformity variable shows significant positive effect (β=0.284, $p < 0.05$) on the acceptance rate. Therefore, hypotheses 2 can be supported, which mentions that the higher the perceived non-conformity (independence and criticality), the higher the participation in crowdsourcing. At the same time, the Non-conformity * Monetary moderator has a significant negative effect (β=-0.444, $p < 0.05$). This supports hypotheses 3, which mentions that the presence of a moderator effect of non-conformity * monetary incentives decreases participation in crowdsourcing. This effect has also been visualised in figure 5.1.

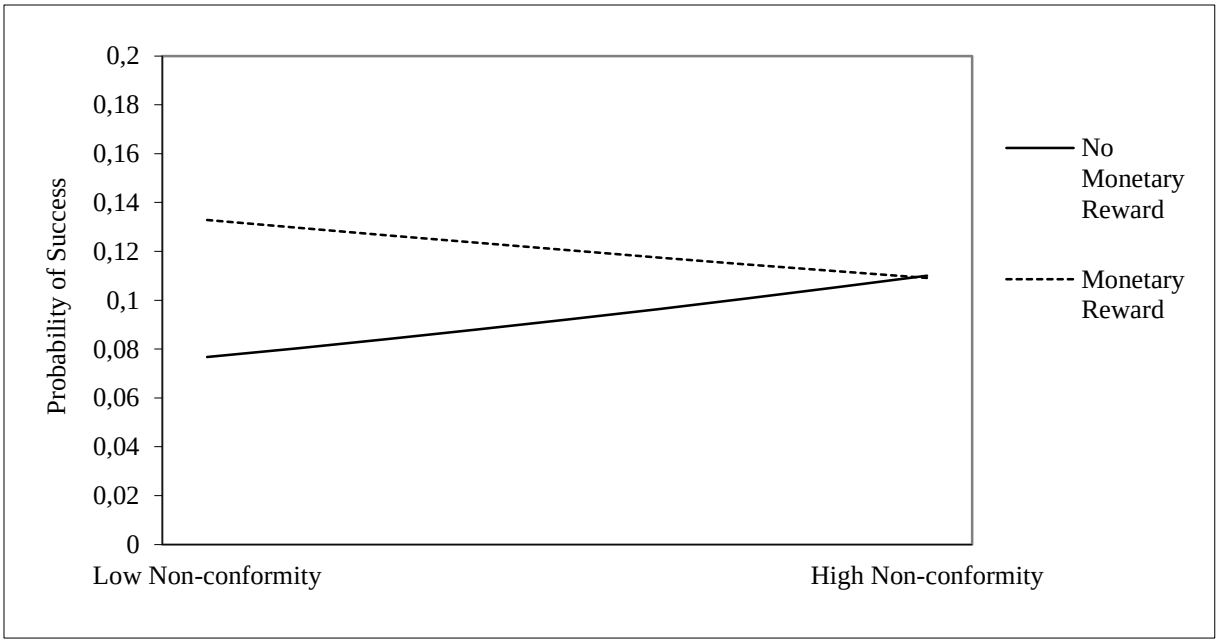

Figure 5.1: Effect of the Non-conformity * Monetary Moderator on the Non-Conformity Variable

Model 5 includes both moderator variables, Non-conformity * Recognition and Non-conformity * Monetary, that were analysed in model 3 and 4. This model shows similar insights as models 3 and 4.

Logistic regression in SPSS tests a regression model's fit through several parameters, which includes the -2log likelihood parameter and the Nagelkerke R^2 value. The -2log likelihood explains the fit of the model, where a decreasing value indicates an increased fit between different models. As Table 5.6 shows, the -2log likelihood has decreased with each model, from 2072.595 in model 1 to 2060.473 in model 5, indicating a better fit. The Nagelkerke R^2 value is a pseudo R^2, as compared to the R^2 of an OLS regression model. The increased value of the Nagelkerke R^2 shows that the models have increased the fit, as more variables were added. Because of the large sample size, the Nagelkerke R^2 value of 0.057 in the last model can be considered reasonable. Besides testing for the -2log likelihood and Nagelkerke R^2, the model X^2 was considered as well by conducting the Omnibus test of model coefficients. The Omnibus test tests if there is some predictive power in the regression model. The increase in the model X^2 value through the different models, from 84.141 ($p < 0.01$) in the first model to 96.263 ($p < 0.01$) in the fourth model shows that the predictive power has increased.

Table 5.5
Descriptive Statistics and Variable Correlations for Participation Rate Analysis

No.	Variable	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
1.	Accepted	0.08	0.27																		
2.	Tenure	8.49	3.03	-0.02																	
3.	Manager	0.46	0.50	0.02	-0.02																
4.	Service unit	0.70	0.46	0.06**	-0.04*	0.23**															
5.	Sales unit	0.25	0.43	-0.07**	0.02	-0.21**															
6.	Other unit	0.06	0.23	0.02	0.03	-0.05**															
7.	Region RASO	0.07	0.25	-0.04*	0.010**	0.02	-0.01	-0.00	0.03												
8.	Region RINA	0.14	0.35	0.11*	-0.26**	0.15**	0.20**	-0.18**	-0.06**												
9.	Region RLAM	0.07	0.03	0.01	0.06**	0.01	0.00	0.01	-0.02												
10.	Region RMEA	0.04	0.20	0.014	-0.13**	-0.09**	-0.12**	0.11**	0.03												
11.	Region RMED	0.16	0.36	-0.04*	0.01	0.02	-0.03	0.04*	-0.01												
12.	Region RNAM	0.15	0.35	-0.05**	-0.05**	0.04**	0.01	-0.05**	0.08**												
13.	Region RNEA	0.14	0-35	-0.01	-0.07**	-0.05**	-0.13**	0.14**	0.01												
14.	Region RSSA	0.02	0-15	0.05**	-0.08**	-0.03	-0.03*	0.03	0.01												
15.	Region RWCE	0.13	0.34	-0.01	0.23**	-0.03	0.01	0.02	0.05**												
16.	Region Sweden	0.06	0.24	-0.04*	0.16**	-0.13**	0.10**	-0.10**	-0.02												
17.	Non-conformity	1.01	0.70	0.02	0.01	0.01	-0.02	0.01	0.02	0.01	-0.04**	0.00	0.02	0.02	0.01	0.00	0.01	-0.00	-0.01		
18.	Recognition	0.33	0.47	-0.01	-0.01	-0.02	0.00	-0.02	0.03	0.02	0.01	-0.01	-0.01	-0.02	0.02	0.01	0.00	0.01	-0.02	-0.01	
19.	Monetary	0.34	0.47	0.03*	0.00	0.02	-0.00	0.01	-0.01	-0.01	0.01	0.02	0.03	-0.00	-0.02	-0.00	-0.00	-0.01	-0.00	0.01	-0.50**

[a] Bivariate Pearson's correlations are reported
[b] 2-tailed significance reported
[c] $p < 0.05$: *, $p < 0.01$: **

Table 5.6
Logistic Regression Models for the Dependent Variable of Participation

No.	Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	Control					
1.	Tenure	0.029 (0.022)	0.029 (0.022)	0.030 (0.022)	0.030 (0.022)	0.030 (0.022)
2.	Manager	-0.071 (0.125)	-0.080 (0.126)	-0.078 (0.126)	-0.078 (0.126)	-0.078 (0.126)
3.	Service unit	-0.141 (0.251)	-0.139 (0.251)	-0.135 (0.251)	-0.121 (0.251)	-0.121 (0.251)
4.	Sales unit	-0.779*** (0.283)	-0.787*** (0.283)	-0.781*** (0.283)	-0.768*** (0.284)	-0.768*** (0.284)
5.	Region RASO	-1.017** (0.487)	-0.981** (0.488)	-0.988** (0.488)	-1.006** (0.488)	-1.006** (0.488)
6.	Region RINA	0.338 (0.407)	0.432 (0.408)	0.427 (0.408)	0.420 (0.407)	0.420 (0.407)
7.	Region RLAM	-0.140 (0.432)	-0.113 (0.433)	-0.120 (0.433)	-0.119 (0.433)	-0.119 (0.433)
8.	Region RMEA	0.086 (0.463)	0.108 (0.464)	0.107 (0.464)	0.101 (0.464)	0.101 (0.464)
9.	Region RMED	-0.632 (0.416)	-0.598 (0.417)	-0.601 (0.417)	-0.612 (0.417)	-0.612 (0.417)
10.	Region RNAM	-0.835* (0.426)	-0.797* (0.427)	-0.805* (0.427)	-0.822* (0.427)	-0.822* (0.427)
11.	Region RNEA	-0.279 (0.411)	-0.244 (0.412)	-0.251 (0.412)	-0.261 (0.412)	-0.260 (0.412)
12.	Region RSSA	0.654 (0.476)	0.699 (0.477)	0.684 (0.477)	0.663 (0.477)	0.664 (0.477)
13.	Region RWCE	-0.415 (0.414)	-0.370 (0.414)	-0.383 (0.414)	-0.396 (0.415)	-0.396 (0.415)
14.	Region Sweden	-1.332** (0.523)	-1.290** (0.524)	-1.303** (0.524)	-1.313** (0.524)	-1.312** (0.524)
	Independent					
15.	Non-conformity		0.106 (0.086)	0.026 (0.105)	0.284** (0.164)	0.293* (0.164)
16.	Recognition		0.098 (0.153)	-0.164 (0.251)	0.097 (0.291)	0.117 (0.291)
17.	Monetary		0.294** (0.148)	0.296** (0.148)	0.750*** (0.267)	0.760*** (0.267)
	Moderator					
18.	Non-conformity * Recognition			0.249 (0.186)		-0.018 (0.224)
19.	Non-conformity * Monetary				-0.444** (0.177)	-0.453** (0.213)
	-2log likelihood	2072.595	2066.808	2065.010	2060.479	2060.473
	Nagelkerke R^2	0.050	0.054	0.055	0.057	0.057
	X^2	84.141***	89.929***	91.727***	96.257***	96.263***

[a] Beta weights reported
[b] Standard errors reported in parentheses
[c] Model X^2 reported
[d] $p < 0.1$: *, $p < 0.05$: **, $p < 0.01$: ***

6 Crowdsourcing Initiative

This chapter presents the results from the crowdsourcing initiative and analyses how different variables affect the results of the crowdsourcing initiative. The chapter will start by presenting the hypotheses and method behind the data collection. This is followed by a description of how the evaluation of the results was conducted. The chapter concludes with an analysis of the results.

6.1 Hypotheses

For this part of the research project, a set of hypotheses were created. These hypotheses were based on literature about crowdsourcing presented in chapter 2. Malhotra et al. (2017) mention that an evolutionary framing of the task may hinder participants' creativity. Miller (1982) also mention that disruptive changes may be costlier than evolutionary ones. Hence, the following hypotheses were formulated:

H4: The presence of a disruption setting in a crowdsourcing initiative increases the novelty of the resulting business models.

H5 A, B: The presence of a disruption setting in a crowdsourcing initiative decreases a) the usefulness and b) the workability of the resulting business models.

6.2 Treatments

In total, 319 employees participated in the crowdsourcing initiative, including both invited employees, described in chapter 5.1, and not invited employees. To evaluate the hypotheses, participants were randomly divided into several groups that received different treatment. In total, 106 groups were created. 53 of these were groups consisting of only 1 individual. The other 53 groups were groups of 5 employees, except for one group which was a group of 6 employees. 27 groups with multiple people received the treatment of evolution, while the other 26 groups received the treatment of disruption. Similarly, 26 of the groups with individuals received the treatment of evolution, while 27 individual groups received the treatment of disruption. The purpose of this division into group or individuals and treatments of evolution or disruption was to analyse how these variables affected the resulting business ideas.

Table 6.1
Summary of Treatments Distribution

Treatment	Number of Groups	Group Size	Total Participants
Evolution	27	5 (1 group with 6 members)	136
Disruption	26	5	130
Evolution	26	1	26
Disruption	27	1	27

The groups which had multiple people were invited to participate in CoDigital, while those who were in individual groups were asked to send in their business model through email, by writing in a box with a 2000 character limit in an attached Word document. CoDigital had the same restriction of 2000 characters for an idea, but also included functionality of voting for your group members' ideas and editing others' ideas to create a dynamic collaborative experience, which were the factors that distinguished the platform from those who worked individually. The participants in each group knew who the other members in their group were, so they could communicate to develop their ideas. The crowdsourcing initiative was conducted from the 24th of April 2018 until the 10th of May 2018, with a reminder email being sent out every day to all participants, reminding them to submit ideas.

6.3 Evaluation Process

The quality of the ideas was evaluated by looking at three different grading categories, i.e., novelty, usefulness and workability. These categories are found in previous research (e.g., Poetz and Schreier, 2012; Franke et al., 2006; Amabile et al., 2005; Kristensson et al., 2004), and are also similar to factors found in traditional new product development (Poetz and Schreier, 2012). This approach is called the consensual assessment technique and is described to be a theoretical way of evaluating creative processes and ideas (Amabile, 2005). The method also goes in line with previous research (e.g., Poetz and Schreier 2012; Franke et al., 2006; Amabile et al., 2005; Kristensson et al., 2004). A ten-point scale was used to grade each category, in line with the work of Franke et al. (2006). A "1" meant low novelty/usefulness/workability, and a "10" was high novelty/usefulness/workability.

Novelty refers to the originality of the idea (de Brömmelstroet, 2014), i.e., the solution referred to a non-route way of using distributed cloud for Ericsson. Two different examples of novelty, taken from the submitted ideas, together with a motivation behind the grading, can be found in table 6.2.

Table 6.2
Example of Evaluation of Novelty

Novelty	Idea	Motivation
Low (graded 2)	"Ericsson has always had a vision for the networked society. This involves the idea of connected cars. For a car to be able to communicate with each other on real time basis, the latency of the network needs to be extremely low to make it practically beneficial […]"	An already existing idea within Ericsson and therefore not a novel idea.
High (graded 8)	"Use of immersive technologies in the field of Education: - Universities, Colleges, Corporate Trainers who seek larger audience outside of traditional class room participants, Institutions who are looking to scale up participation and attract off campus enrolment from audience/ students in their platforms/ course, and in turn help their brand value enhancement can be the target customers. […]"	New way of using distributed cloud for Ericsson and potential new customers.

Usefulness is graded based on potential customer benefit (Poetz and Schreier, 2012), i.e., if the answer contains a specific application, customer or role for Ericsson. Two different

examples of usefulness, taken from the submitted ideas, together with a motivation behind the grading, can be found in table 6.3.

Table 6.3
Example of Evaluation of Usefulness

Usefulness	Idea	Motivation
Low (graded 2)	"We can sell our products as a service (aaS). the customer does not need a real node, but we just connect them to our virtualized products. Depending on the products, different customers can befit […]"	Not a specific solution, customer nor role for Ericsson is mentioned.
High (graded 8)	"[…] The Telco Smart Contract Platform (TSCP) driven by NameA and NameB is addressing this by providing a decentralized and distributed blockchain. Examples of ongoing development with Telcos are roaming, GDPR data privacy […]"	Both a specific application (blockchain) and a specific role for Ericsson is mentioned.

Workability relates to the implementability and feasibility of the idea (de Brömmelstroet, 2014), i.e., the clarity and completeness of the idea, and whether implementation is mentioned or not. How ecosystem is handled is another factor that affected the grading of workability. This is based on the importance of ecosystem mentioned by Bilgeri et al. (2015), and the gathered empirical data which also indicates an increasing importance of ecosystem thinking. Two different examples of workability, taken from the submitted ideas, together with a motivation behind the grading, can be found in table 6.4 below. For the complete framework, please see Appendix C.

Table 6.4
Example of Evaluation of Workability

Workability	Idea	Motivation
Low (graded 2)	"[…] Distributed Cloud capabilities will provide a platform which can adapt and support the differing demands of the service creator and lead to increased revenues […]"	Does not mention how revenues will be generated.
High (graded 8)	"[…] To be able to manage this, there needs to be a definition of how this would be governed (like initial testing and then on-boarding of applications […]"	Mentions implementation and testing.

Each submitted idea (both individual and from teams in CoDigital) was evaluated based on the three criteria, in line with the method used by Poetz and Schreier (2012). The evaluation was also conducted by the two authors of this study. The mean values for each grading criteria of the two graders were thereafter used as the final measurement, in line with previous research (e.g., Poetz and Schreier, 2012; Franke et al., 2006; de Brömmelstroet, 2014; Kristensson et al., 2004). The scores should therefore only be regarded in a relative sense, rather than an absolute measure of quality (de Brömmelstroet, 2014).

Inter-rater reliability was analysed between the two individual graders through use of SPSS. Cohen's Kappa values were 0.593 for novelty criterion grading, 0.588 for usefulness criterion grading and 0.543 for workability criterion grading.

6.4 Evaluation Analysis

Linear regression was used to create different models for seeing how the continuous dependent variables of novelty, usefulness and workability were affected by underlying variables. For this process, SPSS was used. An excel file with all business model submissions were generated through the crowdsourcing platform. Out of the 319 participants in the crowdsourcing initiative, 136 business model ideas had been created, after filtering out submissions which did not contain valid answers or answered the questions at all. 103 unique participants were involved in creating these 136 business models. The 103 contributors had a mean tenure of 8.5 years with a standard deviation of 3.0. The 136 submissions were 77.5% from the service job unit, 11.5% from the sales job unit and the rest from the other job unit. 62 or 45.6% of the contributions came from employees, while 74 or 54.4% came from managers. The number of submissions by region was distributed as shown in the table 6.5

Table 6.5
Business models submitted by Region

Region	Business Models	As of total
RINA	40	29.4%
RMED	28	20.6%
RWCE	18	13.2%
RNEA	14	10.3%
RNAM	12	8.8%
RLAM	9	6.6%
RSSA	6	4.4%
RMEA	5	3.7%
RASO	2	1.5%
RECA	2	1.5%

T-tests were conducted to understand whether the contributors had clearly understood the treatments they had received, and this was conducted in a similar fashion to that of the previous stage of inviting participants, with answers being collected through a web poll, where participants could answer to what extent they had understood the treatments on a 5-grade Likert scale. The first question regarded the evolution treatment and was “In developing the ideas and according to the instructions of this initiative, I assumed that "in the long term our current business model and revenue streams will remain viable and must be protected” and the answer choices were 1) Not at all, 2) To a small extent, 3) To some extent, 4) To a moderate extent 5) To a large extent. Similarly, the second question regarded the treatment of evolution and was phrased as “In developing the ideas and according to the instructions of this initiative, I assumed that “in the long term our current business model and revenue streams will lose their viability and must be replaced”. Again, the options were 1) Not at all, 2) To a small extent, 3) To some extent, 4) To a moderate extent 5) To a large extent. The answers were clustered into two groups, those who had answered 1) Not at all in the group of those who had reported not to receive the treatment and those who had answer any of the option 2-5

in the group who had reported that they had received the treatment. Conducting T-test for the evolution treatment showed that the participant had understood the treatment, with a T-statistics of -2.072 ($p < 0.05$). The T-test for the disruption treatment showed a T-statistics of 2.270 ($p < 0.05$), again showing that the participants had understood the treatment.

Descriptive statistics and a correlation matrix were created with the variables, as can be seen in table 6.9. For each of the three dependent variables of novelty, usefulness and workability, three linear regression models were created to see how the grading criteria are affected, for a total of nine different models. For each of the three dependent variables, the first model included the control variables of tenure, manager (coded as 1 for manager and 0 for employee), service unit, sales unit, CoDigital (coded as 1 for CoDigital setting and 0 for individual setting) and the regions RASO, RINA, RLAM, RMEA, RMED, RNAM, RNEA, RSSA and RWCE. The second model for each of the dependent variables included the independent variable of disruption, showing whether they received the disruption treatment (coded as 1) or the evolution treatment (coded as 0). Finally, the third model for each dependent variable added the moderator effect between disruption and CoDigital. The resulting models will now be presented in the following sections.

6.4.1 Dependent Variable – Novelty

The first linear regression model examined what effect the control variables had on the dependent variable of Novelty. The model shows that participants in the Service unit have a significant positive effect ($\beta=0.911$, $p < 0.05$) on novelty, and are predicted to receive 0.911 higher score in novelty. Furthermore, participants in the Sales unit have a positive significant effect ($\beta=0.988$, $p < 0.01$) on novelty, predicted to receive 0.988 higher score in novelty.

The second linear regression model added the independent variable of Disruption. This model shows significant positive effects ($\beta=1.638$, $p < 0.01$) of Disruption on the novelty grading, showing that those who had the disruption treatment were more likely to receive 1.638 points higher grade in novelty. This supports hypotheses 4, which mentions that the presence of a disruption setting in a crowdsourcing initiative increases the novelty of the resulting business models. Additionally, this model shows that tenure had a small significant negative effect ($\beta=-0.095$, $p < 0.1$) on novelty.

The third model adds the moderator effect of Disruption * CoDigital. The moderator variable shows no significant effects on the novelty variable. Still, the Disruption variable has a positive significant effect ($\beta=1.152$, $p < 0.1$) on the novelty variable.
The R^2 for the three models are increasing, from 0.148 in the first model, 0,362 in the second and 0.366 in the third. This increase shows that the variables explain more of the variance in the model, showing that the models are increasingly better. The adjusted R^2 adjusts for the increase in the numbers of variables and shows 0.049 for the first model, 0.283 for the second and 0.281 for the third. See table 6.6 for a summary of the linear regression models for the dependent variable of novelty.

Table 6.6
Linear Regression Models for the Dependent Variable of Novelty

No.	Variables	Model 1	Model 2	Model 3
	Control			
1.	Tenure	-0.009 (0.061)	-0.095* (0.055)	-0.085 (0.056)
2.	Manager	0.053 (0.291)	-0.127 (0.254)	-0.155 (0.257)
3.	Service unit	0.911** (0.454)	0.517 (0.399)	0.533 (0.400)
4.	Sales unit	0.988* (0.586)	0.517 (0.514)	0.538 (0.516)
5.	CoDigital	0.228 (0.404)	0.494 (0.354)	0.195 (0.515)
6.	Region RASO	-1.483 (1.658)	-1.058 (1.441)	-0.965 (1.448)
7.	Region RINA	0.766 (1.339)	-0.009 (1.169)	0.117 (1.181)
8.	Region RLAM	0.544 (1.358)	-0.102 (1.183)	0.001 (1.192)
9.	Region RMEA	0.038 (1.436)	-0.103 (1.248)	-0.049 (1.251)
10.	Region RMED	0.958 (1.280)	0.433 (1.115)	0.527 (1.123)
11.	Region RNAM	0.049 (1.385)	-0.540 (1.207)	-0.403 (1.221)
12.	Region RNEA	-0.156 (1.316)	-0.690 (1.146)	-0.661 (1.149)
13.	Region RSSA	-0.672 (1.487)	-1.142 (1.294)	-1.015 (1.305)
14.	Region RWCE	-0.080 (1.285)	-0.016 (1.116)	0.059 (1.121)
	Independent			
15.	Disruption		1.638*** (0.258)	1.152* (0.660)
	Moderator			
16.	Disruption * CoDigital			0.564 (0.706)
	R^2	0.148	0.362	0.366
	Adjusted R^2	0.049	0.283	0.281

[a] Beta weights reported
[b] Standard errors reported in parentheses
[c] $p < 0.1$: *, $p < 0.05$: **, $p < 0.01$: ***

6.4.2 Dependent Variable – Usefulness

The first model evaluates the effects of the control variables. In this model, it is evident that participants in the Service unit have a significant positive effect (β=0.673, $p < 0.1$) on the usefulness variable, where the model predicts that they receive 0.673 points higher grading in usefulness. Similarly, participants in the Sales unit had a significant positive effect (β=0.900, $p < 0.05$) on the usefulness variable.

In model two, the Disruption variable is added. This model shows that Disruption has a significant positive effect (β=0.521, $p < 0.05$) on the dependant variable usefulness, which predicts that a disruption setting will result in 0.521 points higher grade in usefulness of the business models. This does not support hypotheses 5A, which mentions that the presence of a disruption setting in a crowdsourcing initiative decreases the usefulness of the resulting business models. Moreover, the control variable Tenure has a significant negative effect (β=-0.095, $p < 0.05$) on the usefulness variable.

The third model adds the moderator variable of Disruption * CoDigital. This variable shows no significant effect on the usefulness variable. In this model, Disruption again shows a significant positive effect (β=1.161, $p < 0.05$) on usefulness. The variable Tenure shows a significant negative effect (β=-0.108, $p < 0.05$) again.

The three models show increasing R^2, with 0.111 in the first model, 0.149 in the second and 0.160 in the third, showing that more of the models' variance is explained by the addition of variables. The adjusted R^2 for the first model is 0.008, 0.043 for the second model and 0.047 for the third model. See table 6.7 for a summary of the linear regression models for the dependent variable of usefulness.

Table 6.7
Linear Regression Models for the Dependent Variable of Usefulness

No.	Variables	Model 1	Model 2	Model 3
	Control			
1.	Tenure	-0.068 (0.047)	-0.095** (0.047)	-0.108** (0.048)
2.	Manager	-0.098 (0.223)	-0.155 (0.221)	-0.118 (0.222)
3.	Service unit	0.673* (0.348)	0.548 (0.346)	0.527 (0.346)
4.	Sales unit	0.900** (0.450)	0.750* (0.446)	0.722 (0.446)
5.	CoDigital	-0.172 (0.310)	-0.087 (0.307)	0.307 (0.445)
6.	Region RASO	0.193 (1.272)	0.328 (1.251)	0.206 (1.252)
7.	Region RINA	0.707 (1.027)	0.460 (1.015)	0.294 (1.022)
8.	Region RLAM	0.921 (1.042)	0.715 (1.027)	0.579 (1.031)
9.	Region RMEA	0.630 (1.103)	0.585 (1.083)	0.514 (1.082)
10.	Region RMED	0.699 (0.982)	0.532 (0.967)	0.407 (0.971)
11.	Region RNAM	0.628 (1.063)	0.440 (1.047)	0.259 (1.056)
12.	Region RNEA	0.504 (1.010)	0.334 (0.995)	0.295 (0.993)
13.	Region RSSA	0.001 (1.141)	-0.149 (1.123)	-0.316 (1.129)
14.	Region RWCE	0.912 (0.986)	0.932 (0.968)	0.834 (0.970)
	Independent			
15.	Disruption		0.521** (0.224)	1.161** (0.571)
	Moderator			
16.	Disruption * CoDigital			-0.744 (0.611)
	R^2	0.111	0.149	0.160
	Adjusted R^2	0.008	0.043	0.047

[a] Beta weights reported
[b] Standard errors reported in parentheses
[c] $p < 0.1$: *, $p < 0.05$: **, $p < 0.01$: ***

6.4.3 Dependent Variable – Workability

In the first model, the control variables show no significant effect on the dependent variable of Workability. Model 2 shows that the Disruption variable has a significant negative effect (β=-1.320, $p < 0.01$) on workability, where the model predicts that those who had the disruption treatment receive 1.320 points lower grade in workability. This finding supports hypotheses 5B, which says that the presence of a disruption setting in a crowdsourcing initiative decreases the workability of the resulting business models. Additionally, the control variable Service unit has a significant positive effect (β=0.529, $p < 0.1$) on workability.

In model 3, the moderator effect of Disruption * CoDigital shows no significant effect. The disruption variable still has a significant negative effect (β=1.304, $p < 0.05$) on workability and the service unit variable still has a significant positive effect (β=0.529, $p < 0.1$) on workability.

The R^2 for the models increase, from 0.174 in the first, to 0.406 in second and third model. This shows that the variables explain more of the models' variance. The adjusted R^2 in the first model is 0.079, 0.332 in the second model and 0.326 in the third model. See table 6.8 for a summary of the linear regression models for the dependent variable of workability.

Table 6.8
Linear Regression Models for the Dependent Variable of Workability

No.	Variables	Model 1	Model 2	Model 3
	Control			
1.	Tenure	-0.055 (0.047)	0.014 (0.041)	0.014 (0.042)
2.	Manager	0.142 (0.222)	0.287 (0.190)	0.288 (0.193)
3.	Service unit	0.211 (0.347)	0.529* (0.299)	0.528* (0.300)
4.	Sales unit	-0.154 (0.448)	0.227 (0.385)	0.226 (0.387)
5.	CoDigital	0.213 (0.309)	-0.002 (0.265)	0.009 (0.387)
6.	Region RASO	-1.080 (1.266)	-1.423 (1.079)	-1.426 (1.087)
7.	Region RINA	-0.245 (1.022)	0.380 (0.875)	0.376 (0.887)
8.	Region RLAM	0.413 (1.037)	0.935 (0.886)	0.931 (0.895)
9.	Region RMEA	0.176 (1.097)	0.289 (0.934)	0.287 (0.940)
10.	Region RMED	-0.651 (0.977)	-0.227 (0.835)	-0.230 (0.843)
11.	Region RNAM	-0.018 (1.058)	0.457 (0.904)	0.452 (0.916)
12.	Region RNEA	-0.393 (1.005)	0.037 (0.858)	0.036 (0.862)
13.	Region RSSA	-0.328 (1.136)	0.051 (0.969)	0.047 (0.980)
14.	Region RWCE	0.796 (0.981)	0.745 (0.835)	0.742 (0.842)
	Independent			
15.	Disruption		-1.320*** (0.193)	-1.304** (0.496)
	Moderator			
16.	Disruption * CoDigital			-0.019 (0.530)
	R^2	0.174	0.406	0.406
	Adjusted R^2	0.079	0.332	0.326

[a] Beta weights reported
[b] Standard errors reported in parentheses
[c] $p < 0.1$: *, $p < 0.05$: **, $p < 0.01$: ***

Table 6.9
Descriptive Statistics and Variable Correlations for Evaluation Analysis

No.	Variable	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1.	Novelty	5.24	1.63																	
2.	Usefulness	4.35	1.22	0.61**																
3.	Workability	4.46	1.26	0.03	0.36**															
4.	Tenure	8.52	2.95	-0.09	-0.17*	-0.15														
5.	Manager	0.54	0.50	0.01	-0.03	0.07	-0.25**													
6.	Service unit	0.77	0.43	0.15	0.13	0.17*	-0.25**	0.05												
7.	Sales unit	0.12	0.32	-0.01	0.06	-0.10	0.14	-0.12	-0.66**											
8.	CoDigital	0.85	0.36	0.08	-0.04	0.03	-0.06	0.10	0.10	-0.10										
9.	Region RASO	0.02	0.12	-0.17*	-0.11	-0.12	0.20*	-0.01	-0.08	-0.05	0.05									
10.	Region RINA	0.29	0.46	0.17	0.08	0.03	-0.43**	0.20*	0.17	-0.19*	0.01									
11.	Region RLAM	0.07	0.25	0.03	0.04	0.10	0.09	-0.11	0.01	-0.01	0.03									
12.	Region RMEA	0.04	0.19	-0.05	-0.01	0.04	0.00	-0.06	-0.08	0.05	-0.03									
13.	Region RMED	0.21	0.41	0.16	-0.05	-0.25**	0.27**	-0.12	-0.06	-0.02	0.12									
14.	Region RNAM	0.09	0.29	-0.05	0.02	0.06	-0.16	0.02	0.05	-0.03	0.06									
15.	Region RNEA	0.10	0.31	-0.12	-0.04	-0.10	0.02	0.07	-0.21*	0.25**	-0.06									
16.	Region RSSA	0.04	0.21	-0.12	-0.09	0.01	-0.14	0.05	0.12	-0.08	0.09									
17.	Region RWCE	0.13	0.34	-0.10	0.08	0.25**	0.21*	-0.08	0.06	0.06	-0.13									
18.	Disruption	0.44	0.50	0.50**	0.19*	-0.50**	0.11	0.07	0.04	0.04	-0.07	-0.11	0.11	0.06	-0.10	0.06	-0.02	0.04	-0.05	-0.17*

[a] Bivariate Pearson's correlations are reported
[b] 2-tailed significance reported
[c] $p < 0.05$: *, $p < 0.01$: **

7 Discussion

A knowledge gap exists within research concerning how different variables affect the participation rate and the results of a corporate governed crowdsourcing initiative. Research have provided contradictory results related to the respective importance of motivational factors (e.g., Bonabeau, 2009; Simula and Vouri. 2012; Harper et al., 2008; Skopik et al., 2012; Muhdi and Boutellier, 2011; Antikainen et al., 2010). Another knowledge gap exists related to how different governance factors of an internal crowdsourcing initiative will affect the results. Calls for further empirical studies have been stated in literature (e.g., Henttonen et al., 2017; Garrigos-Simon et al., 2015; Poetz and Schreier, 2012).

This study of an internal crowdsourcing initiative at Ericsson AB in Stockholm has been conducted to answer these calls for future research, and to provide further empirical data to the body of knowledge related to internal crowdsourcing, participation rate and results. By manipulating invitation letters to participants, variables affecting the participation rate in a crowdsourcing initiative were analysed. Similarly, by manipulating the task formulations in the crowdsourcing initiative, variables affecting the crowdsourcing initiative's results were also analysed.

The set of hypotheses established have through statistical analysis either been supported or not supported. In table 7.1, a summary of the hypotheses and the resulting status of these can be seen.

Table 7.1
Summary of the Status of the Established Hypotheses

Hypotheses	Status
H1A: Presence of monetary incentives increases the participation rate in crowdsourcing.	Supported
H1B: Presence of recognition incentives increases the participation rate in crowdsourcing.	Not supported
H2: The higher the perceived non-conformity (independence and criticality), the higher the participation in crowdsourcing.	Supported
H3: The presence of a moderator effect of non-conformity * monetary incentives decreases participation in crowdsourcing.	Supported
H4A: The presence of a disruption setting in a crowdsourcing initiative increases the novelty of the resulting business models.	Supported
H5A: The presence of a disruption setting in a crowdsourcing initiative decreases the usefulness of the resulting business models.	Not supported
H5B: The presence of a disruption setting in a crowdsourcing initiative decreases the workability of the resulting business models.	Supported

The statistical analysis has found that a monetary incentive has a significant positive impact for participation in a crowdsourcing initiative, while a recognition incentive has no significant effect on participation. The cause for this could be that a recognition incentive (in this study, a letter acknowledging the participant's success to senior management) could have different

values to different participants, where some invited employees already in a senior position potentially see a smaller value in such a reward, compared to employees who are junior in the company. On the other hand, monetary value has a universal status, where additional money in almost all cases has the same value regardless of the invited participants' current financial status. Additionally, because of the large prize of USD 3500, the alternative costs for most participants could be considered as low, i.e., a relatively small effort was needed by the participants to potentially earn a relatively large sum of money.

When the participants were given independence and a critical setting, described as non-conformity, they were more likely to choose to participant in the crowdsourcing initiative. One cause for this could be that an initiative where the participants would be critical and independent allow participants to have more creativity and as a result motivates them to participate. However, when the moderator effect of Monetary * Non-conformity was analysed, the positive effect of the monetary incentive was reduced in cases with high non-conformity, as seen in figure 5.1. The cause for this could be that those who want a monetary reward want to abide by formal rules in an organisation in order to progress their careers, which goes against the attributes of non-conformity, i.e., criticality and independence from formal structures.

In the case of evaluating the results of the crowdsourcing process, the findings show that a task formulated in a disruption setting will increase novelty of ideas and decrease the workability of ideas. The cause of this could be that more novel ideas tend to not conform to reality of what is current technological standard, and hence have lower workability.

The research design was carefully considered, and theoretical approved methodologies were used to ensure a high quality of the findings. However, some limitation exists in this research. The initiative was only conducted with a limited amount of people, of limited job roles, from one company, and during a limited time period. To generate higher validity and generalisability, a more extensive initiative, involving more participants and companies, would have had to be conducted. Given more time, other variables affecting the participation rate and results of the initiative could also have been studied. For higher validity, more methodologies could have been used as well, enabling a triangulation of the results to generate a higher understanding.

The process as a whole generated results, indicating that the created business model framework met its purpose. The framework fitted within the crowdsourcing platform, and generated various business models in the crowdsourcing initiative. Conducting similar studies again, the created framework can be of assistance and shorten the time necessary for running a similar initiative with the aim of developing business models for distributed cloud. However, the framework may need to be analysed within the context of its use, e.g., if running a similar initiative in another company.

The results of this study may be of importance for guiding similar initiatives and work in the future. More empirical studies related to internal crowdsourcing in general, and research regarding participation rates and crowdsourcing processes' results are called for. Similar studies conducted in other companies or industries are also called for, to further clarify the generalisability of the findings from this study. This study has however made some important contribution. The results have increased the understanding for which variables affect participation rate and the results from a crowdsourcing initiative, which can be used as a basis for similar studies in the future. More empirical data has also been provided to distributed

cloud's body of knowledge. This data may be of importance for further studies about distributed cloud, since distributed cloud is a relatively new technology with lacking empirical and theoretical data. The study is also of great importance for Ericsson AB, where everything from the results to the empirical data can be used for improving existing distributed cloud business and strategic work within the company.

8 Conclusion

This research project was conducted to answer calls for further research on the topic of crowdsourcing, specifically what variables affect the participation and results of a crowdsourcing initiative. Therefore, the purpose of this research was to organise and analyse a crowdsourcing process in terms of variables that affect participation rate and a crowdsourcing initiative's results.

A business model framework was developed for this crowdsourcing initiative. The business model framework developed was successfully used in the crowdsourcing initiative. The invitation to the crowdsourcing initiative showed that monetary incentives, in this case a USD 3500 reward for the three best business models, had a significant positive effect on the participation rate. Meanwhile, a letter of recognition to senior management for the three best business models had no significant effect on the participation rate. Furthermore, the setting of non-conformity (independence and criticality) showed to have a significant negative effect on participation rate. Finally, the moderator effect of Monetary * Non-conformity had a significant negative effect on participation rate.

For the crowdsourcing initiative, two conclusions can be made. First, a disruption setting has a significant positive effect on novelty of the resulting business models. Second, a disruption setting has a significant negative effect on workability of the resulting business models.

Although these conclusions bring insight into the topic of crowdsourcing, what motivates participation and what affects the results, a call for further research on this topic is made to gauge the generalisability of the results. First, research on the effect of the quantity of monetary incentives may be of interest as a new research topic. Second, research into use of crowdsourcing in other industries is also of interest to facilitate growing strategic uncertainties augmented by rapid technology development.

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10 Appendices

This chapter present additional content that has been used in the project. First, templates used for the interviews are presented in appendix A. Thereafter, the 12 different invitation letters are presented in appendix B.

Appendix A Interview Templates

This chapter present the different interview templates that have been used for the interviews

Appendix A1 Interview Template Version One

What is your background at Ericsson and with distributed clouds? (Background person)

- How would you describe Ericsson's relation to distributed clouds, historically and now?
- We saw that Ericsson released an update to their 5G platform a few days ago, now including distributed cloud solutions. What do you know about this?
- What is your experience concerning crowdsourcing and open innovation?

Could you shortly describe distributed clouds and how it relates to similar terms such as edge and fog computing (Background technology)?

- How does distributed cloud relate to Ericsson's work with 5G services?
- Where would you draw the line between distributed and centralized cloud?

What are the drivers behind distributed clouds, which are the main benefits? (Drivers)

- Where is the core value of DC, as an enabler for other services or a business on its own?

What does it take for Ericsson to successfully offer distributed clouds solutions? (moderators)

- How should Ericsson offer their distributed cloud solutions?
- Who are the main customers for Ericsson's distributed clouds solutions?
- What are the key challenges Ericsson need to overcome?
- Who are the main competitors in this area?
- What are Ericsson's main advantages over these competitors?
- Do competitors offer the same product as Ericsson or is Ericsson doing something different?
- How important are relationships with other actors for the success of distributed clouds?
- What role does data play in distributed cloud solutions? What data is created, captured and used?

What is the outcome of using distributed cloud solutions for Ericsson? (Outcome)

- How could Ericsson monetize their distributed cloud solutions?
- What are the major costs behind distributed cloud solutions?

Ending:

- That was all of our questions; do you want to add anything?
- If you know some persons that you think may be interesting to talk to regarding distributed clouds and business models, we would be very thankful for this information

Appendix A2 Interview Template Version Two

Appendix A **Background person**

- What is your background at Ericsson and with distributed clouds?
- How would you describe Ericsson's relation to distributed clouds, historically and now?
- What is your experience concerning crowdsourcing and open innovation?
- We saw the video of you related to the launch of the update to the 5G platform. Can you explain the part of distributed cloud in this launch and in the 5G platform?

Drivers

- How will distributed cloud provide value for customers?
- So where would you say that the core value of distributed cloud lies, as an enabler for other services or a business on its own?
- Where would you draw the line between distributed and centralized cloud?

Moderators

- What factors are important for Ericsson to successfully offer distributed clouds solutions?
- In which possible ways could Ericsson offer their distributed cloud solutions?
- Who are the potential customers for Ericsson's distributed clouds solutions?
- What are the key challenges Ericsson need to overcome?
- Who are the main competitors in this area?
- What R&C of Ericsson are important for creating advantages over these competitors?
- In which dimensions could Ericsson differentiate their offerings?
- How important are relationships with other actors for the success of distributed clouds?
- Can Ericsson somehow leverage from the data flowing thru their distributed cloud infrastructure?
- How big impact will a shift to distributed clouds, from centralized clouds, have on Ericsson as a company and their business models?

Outcome

- How could Ericsson capture the value created by their distributed cloud solutions?
- What are the major costs behind distributed cloud solutions?

Ending:

- That was all of our questions; do you want to add anything?
- If you know some persons that you think may be interesting to talk to regarding distributed clouds and business models, we would be very thankful for this information.

Appendix A3 Interview Template Version Three for Internet of Things Interview

Background interviewees

- What is your background at Ericsson and with Internet of Things?
- How would you describe Ericsson's relation to Internet of Things, historically and now?
- What is your experience concerning crowdsourcing and open innovation?

Background Internet of Things

- Could you shortly describe what the Internet of Things is?
- What are the drivers behind the Internet of Things?
- Is Internet of Things a concept more related to the future or is it a present at the moment?
- How is the current ways of doing business, and current business models, affected by the emergence of Internet of Things?
- What is your knowledge about distributed clouds?
- How would you describe the relationship between distributed clouds and Internet of Things?

Ericsson moderators

- What does it take for Ericsson to successfully offer Internet of Things solutions?
- How should Ericsson offer their Internet of Things solutions?
- Who are the main customers for Ericssons Internet of Things solutions?
- What are the key challenges Ericsson need to overcome?
- Who are the main competitors for Ericsson?
- What are Ericssons main advantages over these competitors?
- How is Ericsson's current work affected by the emergence of Internet of Things?
- What is the most important part to include in a Internet of Things business model?
- How important are relationships with other actors for the success of Internet of Things solutions?
- What role does data play in Internet of Things solutions? What data is created, captured and used?

Outcome

- What is the outcome of the Internet of Things for Ericsson?
- How could Ericsson monetize their Internet of Things solutions?
- What are the major costs behind implementing Internet of Things solutions?

Ending:

- That was all of our questions; do you want to add anything?
- We will give you our findings when we are finished and invite you to our presentation
- If you know some people that you think may be interesting to talk to, we would be very thankful for this information.

Appendix B Invitation Letters

This section is presenting the 12 different invitation letters to the crowdsourcing initiative.

Appendix B1 Invitation Letter with Treatment of High Independence, Critical and No Incentive

Dear (NAME),

We are excited to invite you to take a part in this open strategy initiative that aims for incorporating knowledge and expertise from across our organization to develop strategies for Distributed Cloud business models. Distributed cloud is one of the important strategic areas for Ericsson and it raises puzzling problems that need to be addressed, particularly there is a demand for new business models. You have received this e-mail because of your valuable expertise and experience with market areas and our customers.

Our vision:

In a digital era, many aspects of our strategy processes **will lose their value and must be overturned** considering the emerging possibilities and requirements. Hence, we pursue a **critical approach** towards the dominant assumptions and processes of strategizing in our company.

We passionately believe in the value of increased inclusivity and transparency in strategy making processes and are **committed to** the realization of open approaches to strategy making.

In this initiative, you will be able to share your strategy ideas in a small virtual team, vote for and edit other's ideas. The process is simple and fast. You participate at your own pace and can easily pop in and out during the week. You will use an online tool called Co-Digital. This one-minute video provides a glimpse on how it works.

The outcomes will be evaluated by experts and the **best three** contributions will be selected and announced during May, 2018.

To participate and receive the instructions simply sign up through this link**.**
The more detailed instructions will be sent prior the start of the initiatives.

We are looking forward to your active engagement and support for generation of Distributed Cloud Business Models.

Best regards,
Johan Selin
Marko Ivanovic
BTEB ER Research Incubation

Appendix B2 Invitation Letter with Treatment of High Independence, Critical and Recognition Incentive

Dear (NAME),

We are excited to invite you to take a part in this open strategy initiative that aims for incorporating knowledge and expertise from across our organization to develop strategies for Distributed Cloud business models. Distributed cloud is one of the important strategic areas for Ericsson and it raises puzzling problems that need to be addressed, particularly there is a demand for new business models. You have received this e-mail because of your valuable expertise and experience with market areas and our customers.

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Best regards,
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Marko Ivanovic
BTEB ER Research Incubation

Appendix B3 Invitation Letter with Treatment of High Independence, Critical and Monetary Incentive

Dear (NAME),

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Marko Ivanovic
BTEB ER Research Incubation

Appendix B4 Invitation Letter with Treatment of High Independence, Supportive and No Incentive

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Our vision:

In a digital era, many aspects of our strategy processes **will retain their value but can be improved** considering the emerging possibilities and requirements. Hence, we pursue a **supportive approach** towards dominant assumptions and processes of strategizing.

We passionately believe in the value of increased inclusivity and transparency in strategy making processes and are **committed to** the realization of open approaches to strategy making.

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Appendix B5 Invitation Letter with Treatment of High Independence, Supportive and Recognition Incentive

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Appendix B7 Invitation Letter with Treatment of Low Independence, Critical and No Incentive

Dear (NAME),

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Appendix B9 Invitation Letter with Treatment of Low Independence, Critical and Monetary Incentive

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Appendix B10 Invitation Letter with Treatment of Low Independence, Supportive and No Incentive

Dear (NAME),

We are excited to invite you to take a part in this open strategy initiative that aims for incorporating knowledge and expertise from across our organization to develop strategies for Distributed Cloud business models. Distributed cloud is one of the important strategic areas for Ericsson and it raises puzzling problems that need to be addressed, particularly there is a demand for new business models. You have received this e-mail because of your valuable expertise and experience with market areas and our customers.

Our vision:

In a digital era, many aspects of our strategy processes **will retain their value but can be improved** considering the emerging possibilities and requirements. Hence, we pursue a **supportive approach** towards dominant assumptions and processes of strategizing.

In this initiative, you will be able to share your strategy ideas in a small virtual team, vote for and edit other's ideas. The process is simple and fast. You participate at your own pace and can easily pop in and out during the week. You will use an online tool called Co-Digital. This one-minute video provides a glimpse on how it works.

The outcomes will be evaluated by experts and the best three contributions will be selected and announced during May, 2018.

To participate and receive the instructions simply sign up through this link**.**
The more detailed instructions will be sent prior the start of the initiatives.

We are looking forward to your active engagement and support for generation of Distributed Cloud Business Models.

Best regards,
Johan Selin
Marko Ivanovic
BTEB ER Research Incubation

Appendix B11 Invitation Letter with Treatment of Low Independence, Supportive and Recognition Incentive

Dear (NAME),

We are excited to invite you to take a part in this open strategy initiative that aims for incorporating knowledge and expertise from across our organization to develop strategies for Distributed Cloud business models. Distributed cloud is one of the important strategic areas for Ericsson and it raises puzzling problems that need to be addressed, particularly there is a demand for new business models. You have received this e-mail because of your valuable expertise and experience with market areas and our customers.

Our vision:

In a digital era, many aspects of our strategy processes **will retain their value but can be improved** considering the emerging possibilities and requirements. Hence, we pursue a **supportive approach** towards dominant assumptions and processes of strategizing.

In this initiative, you will be able to share your strategy ideas in a small virtual team, vote for and edit other's ideas. The process is simple and fast. You participate at your own pace and can easily pop in and out during the week. You will use an online tool called Co-Digital. This one-minute video provides a glimpse on how it works.

The outcomes will be evaluated by experts and the best three contributions will be selected and announced during May, 2018. The best ideas will **receive a recognition letter that will be communicated to senior managers.**

To participate and receive the instructions simply sign up through this link**.**
The more detailed instructions will be sent prior the start of the initiatives.

We are looking forward to your active engagement and support for generation of Distributed Cloud Business Models.

Best regards,
Johan Selin
Marko Ivanovic
BTEB ER Research Incubation

Appendix B12 Invitation Letter with Treatment of Low Independence, Supportive and Monetary Incentive

Dear (NAME),

We are excited to invite you to take a part in this open strategy initiative that aims for incorporating knowledge and expertise from across our organization to develop strategies for Distributed Cloud business models. Distributed cloud is one of the important strategic areas for Ericsson and it raises puzzling problems that need to be addressed, particularly there is a demand for new business models. You have received this e-mail because of your valuable expertise and experience with market areas and our customers.

Our vision:

In a digital era, many aspects of our strategy processes **will retain their value but can be improved** considering the emerging possibilities and requirements. Hence, we pursue a **supportive approach** towards dominant assumptions and processes of strategizing.

In this initiative, you will be able to share your strategy ideas in a small virtual team, vote for and edit other's ideas. The process is simple and fast. You participate at your own pace and can easily pop in and out during the week. You will use an online tool called Co-Digital. This one-minute video provides a glimpse on how it works.

The outcomes will be evaluated by experts and the best three contributions will be selected and announced during May, 2018. The best ideas will be **rewarded with vouchers** (which in total amount to USD 3500).

To participate and receive the instructions simply sign up through this link**.**
The more detailed instructions will be sent prior the start of the initiatives.

We are looking forward to your active engagement and support for generation of Distributed Cloud Business Models.

Best regards,
Johan Selin
Marko Ivanovic
BTEB ER Research Incubation

Appendix C Evaluation Framework

Novelty

- Originality, i.e., non-rote way of using distributed cloud
- Paradigm, i.e., modern vs. alternative way of using distributed cloud

Usefulness

- Application, i.e., if they have given a specific application/need vs. talked about distributed cloud in general (with the traditional benefits such as low latency etc.)
- Customer focus, i.e., if they have mentioned a specific customer or not
- Ericsson's role, i.e., if they have mention a specific role vs. a lack of clarity in Ericsson's role

Workability

- Clarity, i.e., if the answer is clear or contradictory
- Implementation, i.e., if implementation is mentioned or not
- Completeness, i.e., if they answer all the questions or not
- Ecosystem, i.e., if the topic of ecosystem is handled or not