



UNIVERSITY OF GOTHENBURG

Balancing generativity and control when developing digital platforms in product development firms

A qualitative case study of Volvo Cars

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Abstract

Digitalization has affected the essence of products, services and operation which has made a large impact on product development. Traditional product development firms, such as automotive manufacturers, normally undergo a four to five year life-cycle which nowadays is causing products to look old before even entering the market. Firms nowadays innovate by creating platforms rather than single products, as a way to exploit the flexible and open affordances enabled by digitalization. However, managing digital platforms and multi-sided markets entails a lot of strategic challenges and platform providers are struggling to establish and sustain their multi-sided markets. There are always contradictions between maintaining control over the platform and at the same time stimulating third party developers to join the platform and develop new applications. This thesis therefore aims to investigate such contradictions when managing digital platforms. The research question is: How do product developing firms balance generativity and control when developing digital platforms?

This study was conducted through several interviews with employees at Volvo Cars, who are in charge of developing and building platform strategies. The three digital platforms Sensus Connect, Connected Vehicle Cloud, and Roam Delivery were analyzed in this study. To get an understanding of how product development firms develop their digital platforms the Competing Value Framework (CVF) was used in order to analyze existing contradictions between flexibility and control, and between internal and external focus. With the help of the CVF, the analysis showed that the different digital platforms were all founded in different quadrants. This implied that by having multiple platforms in each quadrant in the CVF, it gives a product development firm the opportunity to balance generativity and control.

Key words: Digitalization, Generativity, Control, Platforms, Competing Values Framework

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1. Introduction

Digitalization has affected the essence of products, services and operation which has made a large impact on product development (Yoo et al., 2012) and resulted in many radical changes that have forced organizations to rethink innovation (Yoo et al., 2012; Johannessen & Olsen, 2010). For example, product development firms nowadays must increase their speed in making and implementing strategic decisions since there is a need for continuously shortened life-cycles of products and services (Hitt et al., 2001). Traditional product development firms, such as automotive manufacturers, normally undergo a four to five year life-cycle which nowadays is causing products to look old before even entering the market (Nepal et al., 2012). Furthermore, product development firms also need to compete with global competitors in new ways (Hitt et al., 2001), such as co-creating innovation in an ecosystem or network, instead of the traditional way where innovation was created within hierarchies and predefined outputs (Peppard & Rylander, 2006; Johannessen & Olsen, 2010).

An example of an innovation made possible due to digitalization is connectivity (Johannessen & Olsen, 2010) which has been playing a more important role in the automotive industry. According to Schneiderman (2013), market research has shown that about 60 % of the cars in the world will in a few years be connected to Internet and use smart phone connectivity. But this number could be up to 80 % in the US and West Europe within this year. In 2013, the percentage of connected cars was 11.4 % (Schneiderman, 2013). This has in the automotive industry lead to a great focus on innovations related to the aftersales market (Aboltins & Rivza, 2014). Thus, automotive manufacturers are good examples of traditional product development firms which due to digitalization today need to make a lot of changes.

The need for all these changes triggers a shift where products become platforms. According to Yoo et al. (2012), firms nowadays innovate by creating platforms rather than single products, as a way to exploit the flexible and open affordances enabled by digitalization. The strategic importance of digital platforms has increased, and how to design, build and sustain a vibrant platform has become one of the key innovation requirements (Yoo et al., 2010). The usefulness of a platform is increasingly shaped by its surrounding ecosystem (Tiwana, 2013), and the most economic benefit of the use of the platform is the potential for supporting multi-sided markets (Evans et al, 2006).

However, managing digital platforms and multi-sided markets entails a lot of strategic challenges and platform providers are struggling to establish and sustain their multi-sided markets (Eisenmann et al., 2006). There are always contradictions between maintaining control over the platform and at the same time stimulating third party developers to join the platform and develop new applications (Ghazawneh & Henfridsson, 2013). This thesis therefore aims to investigate such contradictions when managing digital platforms.

1.1 Problem discussion

Even though product development firms are embracing the possibilities of digital platforms and multi-sided markets, there are still a lot of challenges and contradictions to deal with regarding digital platforms. This is a result of the fact that established product development firms have accumulated their knowledge and capabilities in the previous industrial technology and its focus on product innovation (Benner, 2010). What used to work for firms in a more product-based market can now in a platform-based market become their downfall. Thus, there is a need for a different mind-set for strategy. Many of the premises behind old rules of business do no longer stand in the new platform environment (Tiwan, 2013). For product development firms it has been proven difficult to transform innovation norms and practices in order to manage digital technology (Benner, 2010). Since digital platforms have become a key element for innovations with digital technology, there are important implications for organizational analysis. According to Yoo et al. (2012), organizations must be able to manage the balance of generativity and control in the platform. "Generativity is a system's capacity to produce unanticipated change through unfiltered contributions from broad and varied audiences" (Zittrain, 2008 p.70).

Too much control over the platform will run the risk of losing third-party developers, which will lower the generativity of the platform. Although, without any control the digital platform becomes too varied and fragmented and is therefore less useful for both developers and customers which makes it difficult for product development firms to capture value from its own innovations. Hence, there is according to Yoo et al. (2012) a need to consider the role of power, knowledge, culture, and institutional norms when creating and managing platform generativity in multi-sided markets. The common purpose of this study is therefore to provide a deeper knowledge and understanding of digital platforms in product development firms.

1.2 Purpose and research question

Product development firms still struggle to establish and sustain digital platforms due to their product innovation tradition, and there is a need to balance of generativity and control in the digital platform in order to become successful. By investigating the development of different digital platform initiatives, this thesis aims to answer the following research question:

How do product developing firms balance generativity and control when developing digital platforms?

The purpose of this is to provide a deeper knowledge regarding the development of digital platforms for product development firms that are struggling in this area. To get an understanding about how product development firms develop their digital platforms we have used the Competing Value Framework (CVF) developed by Quinn and Rohrbaugh (1983), in order to analyze existing contradictions between flexibility and control, and between internal and external focus. How firms act depend a lot on how they are organized and what organizational legacy

they have. To enable generativity in a platform there is a need for high flexibility in the organization and how firms manage control over their platforms also reflects in the organizational control culture. The CVF is constructed for organizational analysis and emerged from the gathering of effectiveness criteria that organizations use to evaluate the performance and effectiveness of organizations. According to Cameron et al. (2006), the CVF is able to identify the factors that generate most value in individuals and organizations, and it can help leaders to more deeply understand and act more effectively when creating value. Since value nowadays is created in networks enabled by digital platforms, this framework was chosen for this study as a way to investigate how the organizational legacy has created contradictions in how a product development firm is balancing generativity and control in order to manage digital platforms.

1.3 Disposition

This thesis is distributed in the following six chapters:

- 1. Introduction:** This section introduces the reader to the subject, background and what the purpose of this thesis is.
- 2. Method:** This section explains the research approach, research setting, how the study was conducted when collecting data, the selection of respondents, and finally how the data was analyzed.
- 3. Theoretical Framework:** This theoretical framework provides a background understanding of the investigated problem area, and the many challenges product development firms face when developing digital platforms. The Competing Value Framework is also presented, which has formed the basis for the analysis of the results in this study.
- 4. Empirical data:** This section is a compilation of both questions and answers from the conducted interviews, as well as collected secondary data. The results are divided into the three digital platforms that were chosen as basis for this study; Sensus Connect, Connected Vehicle Cloud, and Roam Delivery.
- 5. Analysis and Discussion:** In this section, the empirical results are analyzed and discussed in relation to the theoretical framework of the study, with an emphasis on the Competing Values Framework. Hence, the concepts used within the theoretical framework and the empirical data will be broken down and interwoven since the discussion will focus on the three different platforms.
- 6. Conclusion:** The purpose of this chapter is to answer the research question and present our conclusion.

2. Methodological Approach

This section explains the research approach, research setting, how the study was conducted when collecting data, the selection of respondents, and finally how the data was analyzed.

2.1 Choice of research approach

There is often a distinction between quantitative and qualitative research but according to Bryman (2011), divided opinions exist regarding the distinction of these two approaches. It seems however that their differences are not reduced, but instead have become rather more important and distinct. The main difference between these two methods is that a quantitative study emphasizes numbers and figures (quantification) in the collection and analysis of data, while a qualitative study emphasizes words (Bryman, 2011). According to Tidström and Nyberg (2012), a qualitative approach can also be intended for understanding perceptions, experiences and intentions. The purpose of the study was to understand product developing firms' perceptions, experiences and intentions of developing digital platforms. Thus, we have chosen a qualitative approach for this study which also made it possible for us to explore what the respondents perceived to be important and meaningful (Bryman, 2011). Additionally, a qualitative approach has an epistemological point of view, described by Bryman (2011) as interpretational, which enabled us to establish an understanding of the respondents' social reality.

2.2 Research setting

The starting point and purpose of this study was to investigate and get an understanding of how product developing firms are currently balancing generativity and control when developing digital platforms as a result of the continuously evolving digital technology. This research was conducted in the automotive industry, where there is a lot of cost and innovation pressure (Ili et al., 2010) since customers nowadays expect the same services in the car as they get at home, at the office, or by a smart phone (Aboltins & Rivza, 2014). This choice of industry is based on the fact that the number of growing systems in a car is resulting in a need for shorter release cycles and cost reductions for development. It takes about 2-3 years for an infotainment system to be put in a car after it's developed. Thus, when a brand new car is released the technologies in the car are from a project made years ago. The app development in smartphones and tablets are sometimes updated on a faster than a monthly basis and this causes the automotive technologies to look old, even before entering the market (Meixner et al., 2011). More specifically, the automotive manufacturer Volvo Cars was chosen for this study as a representative of a traditional product development firm. The first Volvo Cars car was built in Gothenburg in 1927, but Volvo Cars has since then become a global brand with manufacturing in Sweden, Belgium and China. Their vision is to be the most progressive and desired premium car brand in the world, with a mission that their global success will be driven by making life less complicated for

people, while strengthening their commitment to safety, quality and the environment. With account of these aspects, Volvo Cars was considered suitable as the research company (Volvo Cars, n.d.).

2.3 Collection of data

Data have been collected for this study by gathering and compiling literature of existing research in the area of the study and by conducting interviews which also form the basis of the main theme and the analysis of this study. In addition, we have also collected data by gathering and compiling relevant press releases from Volvo Cars.

2.3.1 Literature study

It is the compiled theory of existing literature that determines what data that should be collected and how the collected data is later interpreted (Patel & Davidson, 2011). This study began with reading about platforms and digitalization in scientific articles and we were able to gather a lot of existing literature in the subject of this study. The databases that were most commonly used in the search of existing literature were Google Scholar. The most commonly used words and phrases for the searches were: platforms, digital platforms, automotive manufacturer, digitalization, innovation, generativity and control. With this collected data we were able to describe how digitalization has affected platforms. In addition to this, we collected data regarding the Competing Values Framework, which was chosen as the basis for the analysis of this study. The appropriate collected literature formed the theoretical framework of this study, which was later used to form the interview questions which made it possible to link the theoretical and empirical parts of the study.

2.3.2 Interviews

An interview process is considered to be flexible and seeking the worldview of the respondents. It also emphasizes how the respondents frame and understand the specific issues and topics (Bryman & Bell, 2003). The interviews conducted in this study were of a semi-structured nature, meaning that the questions were based on fairly specific topics compiled in an interview guide (view Appendix A). The questions did not follow a specific order. However, when choosing this type of interviews we left a wide scope in how the respondents can reply to the questions. Questions were also added as the interviews proceeded.

The interview questions for the empirical study were formalized based on The Competing Values Framework. The interviews were made face-to-face with the respondents of Volvo Cars in Torslanda, Sweden. Before conducting the interviews, the respondents were informed about the subjects and the aims of the study in order for them to be prepared for the interview (view Appendix B). The time of the interviews varied from 40 to 60 minutes and audio was recorded and later transcribed in order to manage that no important information was lost, all interviews were recorded and later on transcribed.

2.3.3 Selection of respondents

The selection of respondents is an important part of the research methodology (Jacobsen, 2002). The selection of these interviewees was based on their knowledge and positions within the organization. The respondents chosen for this study represent managers at the different digital platforms with a broad and deep knowledge behind the strategies of each platform. In order to not only get opinions from managers, two other respondents were chosen since they work in a more direct contact with the platform projects. Thus, the total number of respondents for this study was five. All respondents provided relevant information regarding the work behind the three digital platform initiatives.

The respondents are presented in order of their Business Unit and the digital platform they are involved with.

Respondent no 1: The respondent is a senior manager responsible for in-car-development within R&D. His department manages things like driver information, audio, infotainment, telematics and connectivity, and also has responsibility for the whole digital interface in the car. The respondent is also responsible for a department called Strategy and Concepts where he manages early stages of projects before they get industrialized.

Respondent no 2: An interactions designer at the the department of Interaction Design & Infotainment, a part of R&D. He worked in the implementation phase of the project of Sensus Connect. The role of his department is to design and specify interaction solutions to the features that should be in the infotainment system.

Respondent no 3: The respondent is an Director for Consumer oriented IT in the department of Information Technology, including IT services for Connected Car offering. He is therefore responsible for business development and strategy, where web- and car based platforms are the specific products. This department was created due to the success of connected cars. IT has now for the first time become a part of the product development.

Respondent no 4: The respondent is a Extended Offer Manager in the department of Marketing and Sales, within an area called Product Marketing where they are doing the marketing of all products, such as the cars and spare parts. The respondent is part of a group called MSS Connectivity, which denotes connected cars and services, where he is developing new possible services and business models for connected cars.

Respondent no 5: The respondent is a Director of Marketing Platforms at the department of Marketing and Sales. He is therefore responsible for the Marketing Platforms department within Brand Marketing. This department is managing the Digital Experience, CRM, My Volvo Cars, Social Media and Business Development sections.

2.3.4 Press releases

To get a broader knowledge of Volvo Cars and to understand their view on their digital platform we have in this study used press releases. The data from press releases are downloaded from www.media.volvocars.com which is Volvo Cars global newsroom online. Press releases are according to Bryman and Bell (2003) a source that is of particular importance to the business and management researcher, this is because of the quantity of documented information about the available organization. However, the press releases relevant for this study were limited to only seven.

2.4 Data analysis

The analysis is then made based on a descriptive approach, where we interpret the interviews and the press releases we have available to see how the organization works with their digital platforms. The analysis of the data is made qualitatively and we were looking for reasons and factors that affected the actions and opinions of the respondents.

Jacobsen (2002) explains that thematisation is a way to create an overview of the materials and to highlight what is recurring, relevant and significant. This is why we have formed our empirical chapter after the same themes we use in the theoretical chapter.

Analyses are made with the Competing Values Framework as the foundation. This is because the framework highlights and is able to identify the factors that generate most value in individuals and organizations. To get an even more clear view over the different digital platforms in this study we also have a figure of the CVF where we have applied the platforms in the quadrants where they organizationally fit.

2.5 Validity and reliability

Validity is according to Jacobsen (2002) the internal validation of the study and how valid the result is. We have in our study ensured the outcome by having a clear structure in the interviews to make sure no information should be lost, we have transcribed the entire interview on the basis of the recording previously made. Validity is also according to Jacobsen (2002) performed to ensure that what we want to measure has been measured. This has been ensured by building a theoretical framework that describes digital platforms and what challenges and tensions they cause in organizations. We have then used the Competing Values Framework to order to analyze how Volvo Cars is developing and managing digital platforms. The Competing Values Framework also contributes in a way that makes it easier to for the reader understand how tensions reflect different types of organizational cultures.

According to Jacobsen (2002), reliability reflects the accuracy of the results and the credibility of the study, ensuring that the result will be the same if the study is done at a later time. We believe

that the reliability of the study is high because the study has a clear theoretical link to the well-known theories and the results we are presenting is produced with a model to ensure that what we want to measure is apparent to the reader. We have in this study interviewed people with great insight of Volvo Cars cars digital platforms, why they were developed, what problem they solved and how they formed strategies around them. These people have given us a credible picture of how the work has been carried out and the problems encountered during the work and how they have proceeded to solve them.

3. Digital Platforms

The platform as a foundation is not something new. For example, automotive platforms produced by General Motors in Ford in the 1920s, the operating systems in the computer industry and two-sided markets had been around for a long times(Evans et al, 2006). With platforms it is possible to reuse design knowledge regarding entire parts, concepts, technologies or ideas (Levandowski et al, 2013), but companies can also use platforms when they lack resources or capabilities to provide all the applications and services needed on their own (Gusumano, 2010). This concept is close to the economic term of the benefits from scale production (Levandowski et al, 2013).

According to Olleros (2008), a digital platform can either be proprietary or public. Platforms that are proprietary are usually developed for profit concerns, and platforms that are public are only intended to serve the public good. Digital platforms can also be closed or open. Closed platforms are constrained to the organizational boundaries and its certified contractors. Open platforms are able to grow on independent parties' non-contractual contributions. Open platforms are meant for business opportunity value and enables new innovation. According to Evans et al. (2006), platforms should also be flexible, fertile and accessible, as well as scalable and evolvable, and the most economic benefit of the platform use is the potential for supporting multi-sided markets.

3.1 From strategy to strategizing

According to Olleros (2008), product development has become richer and more complex as a consequence of digitalization. Formerly, a good product design was well suited for the needs of the customer, but nowadays however, this is something that is taken for granted. The primary product development now has a greater focus on more strategic and less evident dimensions.

Over the years, strategy has undergone a lot of development and reinterpretation (Henfridsson & Lind, 2014; Jarzabkowski et al., 2007). Deliberate managerial planning is still dominating, but emergent strategy has become increasingly important in order to implement information system strategy (Henfridsson & Lind, 2014). To be able to understand human activity when creating and performing strategy, it is essential to change the focus to the actions and interactions of the once practicing strategy (Jarzabkowski et al., 2007). The concept “practice turn” suggests that

strategizing is based on the continuing practices of organizational actors and how they are accommodating and experimenting with different types of occurrences they encounter every day. Strategizing can also be viewed as a process of goal-directed activity that is intended to implement a strategy (Henfridsson & Lind, 2014). Digital business strategy implicates that business models can be shaped by information systems, which also is a part of customer interactions and experiences, business operations and supply chains, products and services, and have connections with regulators and investors. The marketing or supply chain strategy will most likely have a digital component. (Peppard, Galliers & Thorogood, 2014). Traditional business strategy is due to digital technology being reshaped as modular, distributed, cross-functional, and global business processes. This makes it possible for work to be carried out across boundaries of time, distance, and function (Bharadwaj et al., 2013).

This new way of thinking has affected the development of products, and platforms have become a key element of this (Olleros, 2008). The key approach to achieving the future strategic business objectives is to simultaneously increase innovativeness and controlling costs (Ili et al., 2010). Platforms make it possible to bring a variety of products to the market and at the same time keep development costs down (Levandowski et al, 2013). In addition, digital technology has made it possible to build and cultivate a culture that stretches beyond local boundaries (Svahn, 2014). Thus, the view and use of platforms must be changed into embracing multiplicity and functional variety when creating and managing digital platforms.

3.2 Multi-sided markets

Multi-sided markets bring together two or more groups of customers (Hagiu, 2009) where one or multiple platforms enhance the possibility of interaction between end-customers (Rochet & Tirole, 2006). Thus, platforms that engage in multi-sided markets enable interaction between people and businesses (Evans, 2012). With the purpose of increasing (or at least maintaining) revenue, each side of the platform is charged appropriately as a way to engage multiple sides to join (Rochet & Tirole, 2006). Value is created by connecting two or more types of customers. These customers have mutual demands for the use of the platform and the demand depends on the ability to access and engage in value exchange with members of the other groups. The platform also provides services to reduce transaction costs when these customers exchange value. It also maximizes the profit for the customers by choosing prices and other strategic variables that recognizes the interdependence between the groups of customers (Evans, 2012).

According to Eisenmann et al. (2006), multi-sided markets can be found in many industries along with contributors of traditional products and services but there are, however, one fundamental difference between them. In the traditional value chain (Porter, 1985), value moves from the left side (where the cost is) to the right side (where the revenue is). In multi-sided markets, cost and revenue are on both the left and the right side due to platforms having customers on each side. The owners of the platform collect revenue from both sides, but usually

one side is subsidized. The multiple sides of the platform are drawn to each other through a phenomenon called network effects (Eisenmann et al., 2006).

3.3 Network effects

Network effects imply that the number of customers on all sides of the platform affect the value of the platform to any given customer (Eisenmann et al., 2006; Hanseth, 2001; Katz & Shapiro, 1986). Hence, the size of the network affects the benefits created for existing and potential customers. If two platforms are similar in nature, the customers tend to select the one with most customers (Hanseth, 2001; Katz & Shapiro, 1986). The value of the platform increases when the platform links value from all sides (Eisenmann et al., 2006) since one group of customers will not value the platform if there is no other group already connected to the platform (Evans, 2012). The more customers a platform attracts the more the demand for the platform increase, the same effects appears on the application developed for the platform. This effect is called network effects, a large installed base of customer's leads to a large supply of applications (Zhu & Iansiti, 2012). Thus, how valuable the platform can become to the owner and to the customers depends on the growing access to the network of users, which also enables a growing set of complementary products and services (Gawer & Cusumano, 2014). Margins improve when the user base grows since a larger network will increase customers' willingness to pay (Eisenmann et al., 2006).

Network effects can also be defined as both direct (same-sided) and indirect (cross-sided, virtual) (Gawer & Cusumano, 2014; Zhu et al., 2006; Gandal, 2002). Direct network effects imply that the growth of network customers will directly increase its value for everyone in the network, resulting in more sharing options for the network customers (Zhu et al., 2006; Gandal, 2002). Gawer and Cusumano (2014) emphasizes that network effects can be very powerful, especially the direct ones between the platform and the user of a complementary innovation. These types of network effects can sometimes also be reinforced by a technical standard that makes it difficult or expensive to use multiple platforms or to switch from one platform to another. Indirect network effects are sometimes equally or even more powerful (Gawer & Cusumano, 2014). Indirect network effects can be the result of a growing usage of the network if the value increases in compatible networks, such as hardware and software solutions (Zhu et al., 2006). Gandal (2002) accordingly describes indirect network effects as when the number of customers of compatible hardware increases, the demand for compatible software grows (Gandal, 2002).

3.4 Path Dependency

It is for this study important to highlight the concept of path dependency since product development firms have a history which affects their way of developing new technologies and products. According to Hanseth (2001) and Zhu et al. (2006), path dependency means that previous experience has a great impact on the strategic planning for future investments. According to Cohen and Levinthal (1990), a critical component of innovative competencies is the ability to exploit external knowledge but the ability to do so is mainly based on the prior

knowledge in the organization. Thus, the experience level of prior technology affects a product development firm's ability and incentive to develop and implement new technologies. However, this often makes product development firms get stuck in old standards even though the market can offer standards that are newer and better (Zhu et al., 2006). If a product development firm has an extreme case of path dependency and ceases to investigate new capabilities, it may never adapt and exploit new information in a quickly moving field, such as digitalization. According to Augsdorfer (2005), path dependency implies that the range of the investment possibilities for an organization is decided by the different competencies within the firm. This has made it increasingly important to continue the learning and competence building in organizations, in order to be able to move towards more favorable environments. When embarking towards a different knowledge path, the technical relationship with suppliers or customers becomes a powerful barrier (Augsdorfer, 2005).

3.5 Lock-in effects

Lock-ins occurs when a new technology has been introduced. It then becomes very difficult or next to impossible to develop competing technologies. Generally Lock-ins occur every time users invest in multiple complementary and durable assets specific to a particular technology. Different types of lock-ins occur due to for example contractual relations, sustainable purchasing, information systems, databases and suppliers. Even large switching costs can be the cause of lock-ins occurring, because it is costly to switch from one technology standard to another. Many lock-in situations are such that it costs much to leave them and it also requires a lot of planning to do so. It is not just in the hardware and software that lock-ins are created. Also the actual information in the databases and the importance of the individual data elements linked in large and complex networks can also create lock-ins (Hanseth, 2001).

There are basically two strategies to choose from in order to get away from lock-ins and avoid them. One is a strategy of backward compatibility, which provides users with an easy migration path for reducing switching costs so that the user can test new technologies gradually. The second strategy is a revolution strategy of enforcement performance. It is inherently risky and may not work in small scales and it is also difficult to say whether the technique will lift or crash completely. These strategies are based on the force that occurs when innovation meets network effects. It is best to invest in the best possible product or to give up performance to ensure compatibility and easy user customization (Hanseth, 2001).

3.6 Installed Base

Having more applications on a platform create network effects for the platform, but a large Installed base of consumers also creates a large supply of applications (Shapiro and Varian 1999). Research has shown that because of indirect network effects platforms with less control from both sides of the market are likely to attract more consumers and more application developers and over time this type of platforms could overtake the whole market even if they have quality inferior to its competitors (Zhu & Iansiti, 2012). To understand the drivers of

platforms success, long run market structure and market efficiency is key knowledge for managers. According to Schilling (2003) is a new platform unable to make its technology compatible with the incumbent and to be successful the technical advantage must offer as much more value to the consumers so that it exceeds the combination of functionality, installed base, and complementary goods value offered by the incumbent.

3.7 Generativity and control

According to Zittrain (2008, p70) "Generativity is a system's capacity to produce unanticipated change through unfiltered contributions from broad and varied audiences". This implies that software code can be produced from third parts in an open network which no one owns and the code can come from anywhere and everywhere (Post, 2010). According to Yoo et al. (2012), generativity enables digital technologies to become inherently dynamic and flexible. Due to the re-programmability of digital technologies, new capabilities can be added after a product has been designed and produced. Generativity also leaves digital traces whose innovative uses can lead to new innovations that were not originally intended by the innovators or customers (Yoo et al., 2012). Most often generative digital technology are designed without truly knowing how the complete design is going to turn out after integrating different modules with each other (Yoo, 2013). Generativity can in this case be accomplished by creating a platform, which makes it possible for innovations by third-party developers to later on be integrated into the platform (Yoo et al., 2012).

How much a system or a platform allows others to contribute depends according to Zittrain (2008) on both technological functions and social behavior. In order for others to contribute to the platform, it is important how the system relates to its users and how much the users relate to the platform owner. Zittrain (2008) has developed five principles regarding what makes something generative. (1) How extensively a system or technology leverages its tasks. (2) How good it can be adapted to its tasks. (3) How easily people that want to contribute can do so. (4) How available the system is to those who want to contribute. (5) How easy it is to transmit the change to others and especially to those who are not the experts.

Tilson et al. (2010) explain that there are two major challenges caused by generativity, namely change and control. A digital platform must be organized in a way that is both stable and flexible and in the same way offering independent control. Yoo et al. (2012) explain that too much control over the platform will run the risk of losing third-party developers, which will lower the generativity of the platform. Although, without any control the platform becomes too varied and fragmented and is therefore less useful for both developers and customers. According to Elaluf-Calderwood et al. (2011), the company that created the platform for a digital ecosystem becomes the platform owner and creates boundaries regarding control. All the actors in the ecosystem are allowed to participate in the development of the platform to improve it, external actors may want to add applications to make them available for more customers. Also external actors influence

that certain standards will be supported by the platform or be organized in a certain manner to support their own interests. These actions can be seen as attempts to make the platform more generative. It is the platform owner that manages how generative the ecosystem will become by rejecting or accepting these attempts from other stakeholder (Elaluf-Calderwood et al., 2011).

According to Ghazawneh and Henfridsson (2013), in order to successfully build a platform ecosystem the platform owner must change from developing applications to contribute with resources that enable third party development. This development should serve as a regulator function to extend the relationship between the developers and the platform owner. This regulator is also designed to control the platform and the ecosystem. There is always a tension between maintaining control over the platform and at the same time stimulating third party developers to join the platform to develop new applications.

The balance between generativity and control is according to Elaluf-Calderwood et al. (2011) the core of a digital ecosystem. When expanding the platform's functionality and adding on applications, the platform owner acts as a moderator and regulator. The tension that exists between generativity and control is a complex interaction between the multiple sides in the ecosystem. The tension is a battle in design between maintaining platform control and at the same time stimulating third-party developers to join the platform and developing applications to it (Elaluf-Calderwood et al., 2011).

4. Competing Values Framework

According to Cameron et al. (2006), trying to create value is a complex effort for both leaders and organizations, but it is still the objective of all enterprises, workers, leaders. Value creation is traditionally defined by financial measures, which is accurate but incomplete. Value creation is much more complex than the straightforward financial indicators. When experienced executives implement a more complex view, they sometimes speak of the need to consider intangible and tangible assets in order to consider value creation in a more balanced way. Accordingly, it has become clear that there are various indicators associated with value creation, but there are difficulties in understanding and communicating them since they are both diverse and complex. However, Cameron et al. (2006) highlight an underlying framework that is able to identify the factors that generate most value in individuals and organizations. This framework is called the Competing Value Framework and can help leaders to understand more deeply and act more effectively when creating value. The framework also helps leaders to see different potentials of the tensions of organizational life, which others might not.

According to Quinn and Rohrbaugh (1983), The Competing Value Framework (CVF) is constructed for organizational analysis and it did not emerge through observation of actual firms, but from the gathering of effectiveness criteria that organizations use to evaluate the performance and effectiveness of organizations. From the study of the 39 indicators of effectiveness two

major dimensions emerged. According to Cameron et al. (2006), these dimensions express the tension of competing values that exist in every organization. One is drawn vertically and the other one horizontally.

4.1 Flexibility versus Control

The first dimension differentiates the criteria for effectiveness that contributes to flexibility, discretion and dynamism from those criteria that contribute to stability, order and control. One way to view organizations as effective is if they are changing, adaptable and organic, for example if the product mix or the form of the organization is changing often. Another way to be an effective organization is through stable, predictable and mechanistic, for example companies with longevity and staying power in both design and outputs. This dimension moves from versatility to durability (Cameron & Quinn, 2006). Talking about individuals this dimension differentiates people that learn inductively and communicate with creative and visionary ideas and they process information by searching for innovative solutions. People on the control side of this dimension learn deductively and communicate in a rational way with considered ideas, they search for information in a more methodological way (Cameron et al., 2006).

4.2 External versus Internal

The second dimension differentiates effectiveness in an organization if it supports integration, external orientation, differentiation, rivalry and a consistent way of doing business. Opposite of this are organizations that focus on interacting or competing outside their boundaries with global goals and local knowledge and have adoptable units. This dimension form organizational cohesion and consonance to organizational separation and independence (Cameron & Quinn, 2006). People in this dimension differentiate from people with internal focus that learn by examining familiar information, communicate by harmonized strategies and analyzing information in a consistent way. On the other hand external people learn by searching for unfamiliar information, communicate by confronting strategies and process information by analyzing uniqueness and deviations (Cameron et al., 2006).

These two dimensions form four classes (see figure 1) and each of these represent an organizational mindset for effectiveness indicators. They are all each other's opposite and this is also why the framework is named the Competing Values Framework. These indicators represent what people appreciate about organizational performance and they define what's good or bad regarding values. These characteristics explain over time different organizational values has been associated with different forms of organizations (Cameron & Quinn, 2006).

To get a framework that in the best way suits our research on contradictions in digital platforms we have merged both Competing Values Framework's from Cameron and Quinn (2006) and Cameron et al. (2006).



Figure 1: *Illustration of the Competing Values Framework, based on Cameron and Quinn, (2006) and Cameron et al. (2006)*

4.3 The four organizational cultures

Down below the four organizational cultures; Focus, Compete, Collaborate and Create are explained. They are the four profiles in the Competing Values Framework created by the two aforementioned dimensions, and represent different values on how the best possible organization should be designed.

The Focus Quadrant

The Focus organization is one of those classic management rules to gain organizational effectiveness from Weber's studies during the 1900 century. His school was called the attributes of bureaucracy which included rules, specialization, meritocracy, hierarchy, separate ownership, impersonality and accountability. Hierarchy was implemented in organizations that had major challenges in produce efficient, reliable and predictable outputs. Weber's organizational hierarchy was an ideal organizational form because it led to stable, efficient, highly consistent products and services. Because of organizational stability functions could be integrated and coordinated equally in products and services. Keys to success was clear lines regarding decision making, standardized rules and control (Cameron & Quinn, 2006).

According to Cameron et al. (2006), it does things that create value in the focus organization, e.g. continuous improvement by implementing better processes. The organization pace is better, cheaper and safer. Organizational effectiveness is gained through efficient processes, measurements and control. Value creation is managed by statistical processes, control and quality management to make the organizations function more smoothly and efficiently.

These types of organizations are characterized by a formal and structured workplace. Procedures govern what people do and the leaders are the coordinators and organizations. The important thing in this culture is to maintain a smooth running organization and the long term goals are stability, predictability and efficiency. This type of organizational culture is common in major production companies and governments. In these organizations a key to success is large numbers of standardized procedures for new employees to follow, that are easy to learn (Cameron & Quinn, 2006).

The Compete Quadrant

This type of organization became popular in the 1960' and is based on research from Williamson and Ouchi (1980). In this type of organization focus on points regarding effectiveness and the most important is the transaction cost. In this culture the organization is the market and the focus is on external affairs instead of the internal. The decision making is more decentralized and the market operates more under monetary exchanges. The way to gain competitive advantage is through exchanges, sales and contracts with other firms and focus is on the profitability (Cameron & Quinn, 2006).

The core values in a Compete organization are competitiveness and productivity. This is obtained through strong emphasis on external positioning and control. This culture built on the assumption that the market isn't friendly but hostile. Consumers are interested in value and the organization is the core of changing the competitive position and the task for managers to make the organization productive, result and profit focused. The underlying assumption is that an aggressive strategy with a clear purpose is the way to productivity and profitability. Long term focus is achieving goals and targets (Cameron & Quinn, 2006).

According to Cameron et al. (2006) value enhancing activities in the Compete quadrant is a result of the pursuit of competitiveness. Speed is a core element of keeping up with the competitiveness in the global market and a demand for companies in this quadrant is results right now. Other examples of value creating activities significant with the Compete quadrant include outsourcing selected aspects of production or services, investing in customer acquisition and customer service activities, and attacking competitor organization's market position. Quadrant success is measured by indicators such as market share, revenues, meeting budget targets, and growth in profitability position. And speed of action is keys to value creating activities.

The Collaborate Quadrant

This organizational form is called collaborate because of its family-like-organization. This organization form started in the 1970's in Japan. Common for this organization form is shared goals and values, cohesion, participation, individuality and a sense of we-feeling in the organization. This type of firms are more likely extended families than organizational units with instead of rules and hierarchy there is a sense of more teamwork, employee involvement programs and corporate commitment to employees. Focus in this type of firms is more on team accomplishment than the individual performance. This organization manages the environment by teamwork and development of employees. Customers are more seen as partners and management's task are to empower employees (Cameron & Quinn, 2006).

According to Cameron et al. (2006), strategies in the Collaborate quadrant produce most value when there is a need to maintain stability when the organization is facing uncertainty. In order to create long-term success, it is often required to form effective and long-lasting partnerships across organizational boundaries, both inside and outside of the organization. Leadership strategies focus on the development of effective relationships. The key outcomes of the Collaborate quadrant strategies are a sense of community, a commitment to culture, and a willingness to cooperate.

A big advantage of these collaborate firms is that they are change friendly because everyone share the same values. It's a friendly place to work and leaders are more like mentors for their employees. What keeps the organization together is loyalty and commitment. Organizations benefit from long term commitment and success is defined by internal climate (Cameron & Quinn, 2006).

The Create Quadrant

This culture was something that occurred when the world changed from the industrial age to the digital. This is an organizational form that is responsive to turbulent and accelerating conditions of the organizational world in the 21th century. Because of the changing environment this organizational form emphasizes innovation and pioneering as the key to success (Cameron & Quinn, 2006). The ones that are able to succeed in this quadrant are organizations that effectively handle discontinuity, change, and risk. The employees are allowed to speak their minds since this type of organization is characterized by rule breaking and stretching beyond barriers. When an organization is focusing on strategies in this quadrant, it enables them to create a great advantage over their competitors and achieve innovative performances (Cameron et al., 2006).

The purpose of these organizations is to develop new products and services for the future. Tasks for management are to encourage entrepreneurship, creativity and activity. The key behind this organization culture is ad hoc, the meaning of implementing something temporary, specialized and dynamic. The ad hoc teams vanish as soon as the task is achieved. The goal for this type of organizations is to form a culture that is quickly adaptable, flexible and creative when uncertainties, ambiguity and information over flood the market (Cameron & Quinn, 2006). The

ones that typically becomes successful in the Create quadrant doing thoughtful experimentation, learning from mistakes, and failing fast in order to succeed more quickly (Cameron et al., 2006).

Long term goals are rapid growth and acquiring new resources. Success is measured by producing unique products and services, and an important challenge in this type of firms is to produce innovative products and services and adapt quickly to new market opportunities. They differ from the focus- and compete firms because they lack centralized power and authority. Instead, the power flows between teams and employees depending on what problems they are trying to solve at the moment. A common theme in this environment is risk (Cameron & Quinn, 2006) since the possibility of creating new value can offer a lot of potential payoffs, but it can also result in failure (Cameron et al., 2006).

4. Empirical Data

This section is a compilation of both questions and answers from the conducted interviews, as well as collected secondary data. The results are divided into the three digital platforms that was chosen as basis for this study; Sensus Connect, Connected Vehicle Cloud, and Roam Delivery.

Sensus Connect means that the Volvo Cars car is connected to the outside world and gives the customers what they need, when they need it (Press Release, Aug 22, 2014 | ID: 150089). Included in Sensus Connect is a great selection of cloud-based applications which are designed to simplify the entire car experience. It is the new infotainment system of Volvo Cars which provides information, entertainment and features that simplify car ownership. (Press Release, Feb 24, 2014 | ID: 138785). Connected Vehicle Cloud is the backbone service to provide connected in-car-services. Connected Vehicle Cloud is based on Ericsson's Multi Service Delivery Platform and provides infotainment, apps and communication services in new Volvo Cars. Volvo Cars clearly sees that cars in the near future will integrate the same level of digital services that consumers today are used to having at home or at work (Press Release, Dec 17, 2012 | ID: 47168). The platform that enables these types of services in the car is Sensus Connect. However, the car is becoming more than just means of transportation and one example of that is the pilot platform service Roam Delivery which is a new and innovative technology for the automotive industry. Through this service and platform, Volvo Cars enabled the world's first delivery to the car. Hence, no matter where the customers are, they can receive their orders to the Volvo Cars car. Sensus Connect and Roam Delivery are examples of customer centric concepts around the Connected Vehicle Cloud that enhances Volvo Cars idea of a Networked Society which will make the driving experience revolutionized over the coming years (Press release, Feb 20, 2014 | ID: 139114).

To begin with, the following table (view figure 2 - The respondents) presents an overall summary of the previously introduced respondents.

Respondent	Role	Organizational department	Digital Platform
No. 1	Senior manager responsible for in-car-development	Research and Development	Sensus Connect
No. 2	Interactions designer for infotainment system	Research and Development	Senus Connect
No. 3	Director for Consumer-oriented IT	IT	Connected Vehicle Cloud
No. 4	Extended Offer Manager for connected cars	Marketing and Sales	Roam Delivery
No. 5	Director of Marketing Platforms within brand marketing	Marketing and Sales	Roam Delivery

Figure 2: *The interviewed respondents.*

4.1 Digital Platforms

When asked about the development of digital platforms, respondent 5 explained that the digital platforms has enabled direct communication to the end customers ever since Volvo Cars launched their first corporate website in the 1990's. Information to end-customers was published centrally, but nothing was ever sold on the platform since it was only meant for communicating with the end-customers. However, with initiatives like e-commerce the lines become more transparent and eventually disappear. This is the result of communication becoming the service, and the service becoming the product, which is then sold to end-customers. "This transformation is done with the help of digital platforms like Roam Delivery and Volvo On Call, and the digital platform is a facilitator to have end-consumer contact" (Respondent 5). Ever since the car became connected, Volvo Cars now have a direct contact with the customer in the car. The car is part of the digital platform, just like the smartphone is. Even though communication on the

screen in the car is possible, Volvo Cars still only communicate via the website or applications for security reasons.

Volvo Cars Will always put the customer first and act upon what seems best for them. Therefore, customers can in the future expect services that can make their everyday life less complicated, make things less time consuming, and create value. “We will not do everything we can do, just because we can do it” (Respondent 5).

4.2 Sensus Connect

Sensus connect is the new infotainment system of Volvo Cars which provides information, entertainment and features that simplify car ownership. Sensus Connect means that the Volvo Cars car is connected to the outside world and gives you what you need, when you need it. Because the life of consumers become more connected Volvo Cars introduce Sensus Connect, the Connected car platform of Volvo Cars, combined with the Volvo On Call telematics solution and the Volvo On call Smartphone app. Volvo Cars is the first car manufacturer to offer such a system as standard equipment across the entire model range, Volvo Cars is carrying its approach to design and safety into the connected car era (Press Release, Aug 22, 2014 | ID: 150089)..

Sensus Connect was developed to support customers’ growing needs to access infotainment that would be most useful when in the car. All new Volvo Carss come integrated with cloud- and app-based services to make customers’ travels – and lives – easier and more enjoyable. Elements such 3G connectivity service, Wi-Fi hotspot and tethering capabilities, Internet, phone, and text message access (with text-to-speech), in-car infotainment apps, 24/7 call center support with in-car roadside assistance, and more, are all included (Press Release, Aug 22, 2014 | ID: 150089).

“Technology should make your life easier. That’s why we listened carefully to our customers when creating Sensus Connect. It’s not about offering a thousand apps; it’s about giving you precisely what you need, before you even knew you needed it” (Press Release, Jan 07, 2014 | ID: 137382).

4.2.1 Generativity

According to Respondent 2 one of the major reasons why the Sensus Connect was launched was because of Volvo Cars received the second worst rating from users among the 15 automakers that was compared in a research. This is way Volvo Cars needed a new system before the launch of the new XC90.

When talking about projects at Volvo Cars it is important according to Respondent 1 to differentiate projects that involves prototypes like roam delivery and those that are industrialized car projects. Today the development life cycles are long but Respondent 1 has a vision about a three month development time for in car projects. But to make this happen there is a lot of stuff that needs to be in place before, like control of their own development (currently outsourced) and

control of their software. Today all development is med by their suppliers around the world on their specifications. According to respondent 1, it take such a long time to change anything if a software arrives to them and it is wrong, they need to change the specifications and reprogram it. This is according to respondent 1 something that takes a lot of time.” A key to be faster with our car project is to overtake more of our own development. Normally the last parts that aren’t finish in a new car are the software” (Respondent 1).

According to respondent 1, the future for Sensus Connect depends on what decisions their strategist makes. “It is the marketing companies that are closest to the customers who have the largest impact on what we do. Then this needs to be balanced of course. We have an organization called product strategy and they balance how much we should be doing and when. Then of course we discuss what and when things will be done” (Respondent 1).

4.2.2 Control

Apple Car-play is according to Respondent 1 an example of how Volvo Cars manage control of new technologies. Volvo Cars wants Apple Car-play in their cars if it leads to more sold cars. They lose some control because in Apple Car-play Volvo Cars needs to let parts of the screen go to Apple. Volvo Cars cannot control what applications Apple allows in to Car-play and it may bypass applications which interfere with the driver. But this is an ecosystem of its own that is hard to manage. Generally with other applications in the cars Volvo Cars wants to develop their own apps so they work in a Volvo Cars environment. But there are always differences between opinions of companies about how they agree to interact with Volvo Carss infotainment environment. Volvo Cars prefers a collaboration with companies that wants to develop apps for Volvo Cars, but sometimes they need to pay to get some specific applications (Respondent 1).

Respondent 2 explained that Volvo Cars is in full control regarding the cloud platform, including web applications and map updates, etc., but none of the software platform of the head unit in the car. It comprises a lot of vendor and proprietary software. It would according to respondent 2 be best if all development of the platform, core functionality and HMI were made in-house. But Volvo Cars could also go completely the other way by using a platform such as Apple Car-play or Android Auto. Respondent 2 believed that the automotive industry must go in that direction sooner or later, otherwise Volvo Cars will according to him not have a chance to keep up with the development of applications and technologies. Respondent 2 highlighted that it is relatively easy for Volvo Cars to find a partner in this. However, the economy is according to him the biggest constraint. Some potential partners have also declined a partnership since the platform could not offer the functions or the performance they required.

4.2.3 Multi-sided networks

According to respondent 1, Volvo Cars doesn’t see Apple or Google as competitors, such as other car manufacturers. However, Volvo Cars is aware that they may lose the opportunity to sell option package when customers get navigation in Apple Car-play, since the navigation system Volvo Cars can offer is much more expensive according to respondent 1.

4.2.4 Network effects

According to respondent 1 the driver behind the development of the Sensus Connect is the changing world, with its new demands and expectations. Volvo Cars started to talk about connectivity around 2005-2006 when they launched the possibility to connect your phone to the car with Bluetooth. The big change came for Volvo Cars when they launched the possibility to start the heater in the Volvo On Call application. After this introduction the interest in car connectivity exploded. The demand for new technology has increased the last years and this has created opportunities. Electrification and hybrids will also boost connectivity because of the demand to access the car information from the outside.

According to respondent 1, there were two concrete incentives for why the Sensus Connect project was launched. The first incentive was the increased competition since the other competing car manufacturers had introduced connectivity in their cars. Respondent 1 highlighted that market research has shown that more people care about the technology and innovations inside the car when they choose a car brand. The second incentive was to extend the customer relationship. According to respondent 1, the service Customer Service Booking was for example launched in order to increase the customers' relationship with Volvo Cars. "It's always harder to keep the 2nd or 3rd owner of a car to the services provided by Volvo Cars. This is why it is an important part in the connectivity package" (Respondent 1).

4.2.5 Path Dependency

When a new platform enters the opportunities for innovation are high according to respondent 1, and with the new Sensus Connect it is easier to make changes because it is more digital and does not include many physical buttons. But there are always a lot of departments involved when changes need to be done in a car. This is because of everything affecting other parts hand functions, before a new component can be mounted in the car all other departments that are in some way related to it needs to be informed and give clearance for the change. Respondent 1 explained that he always is surprised that this company in the end can produce a car because of the need of all departments to express their opinion before production starts.

4.2.6 Installed Base

According to respondent 1, there are always many other departments involved when they change something in Sensus Connect or the car infotainment. It's unusual for a car manufacturer to start with a brand new platform like Volvo Cars did with the new XC90 now in 2015, last time this happened was back in 1998. This is because many parts in a car are very expensive to change or modify, like the expensive dashboard.

Respondent 2 says that you feel that Volvo Cars is a slow and heavy organization when you work with innovations. There are way too many meetings regarding decisions must be anchored in so many people and organizations with different requirements, and so many people higher up in the organizations think and have opinions about individual details. With smarter choice of technologies and development closer to the requirements, respondent 2 express they Volvo Cars

could easily cut half of the infotainment department and still been able to work more efficiently. There is also a need to change the approach to become more agile, starting with the development of basic functions and then adding on features to keep up. Instead of the "waterfall" method with specifying whole systems and then sent them off to our supplier. Because of that there is not much room for change, and instead of doing it one time with really good the quality is suffering across the entire system when trying to squeeze in too much.

Regarding contradictions there has according to respondent 1 always been conflicts between different departments regarding what are the important parts. There is some who has an attitude towards infotainment that it is just crap and it is the engines that are important. Regarding effectiveness the department of bodywork and also engines has is advanced in development. "Our deferment enters the project later and is also the last things to be finished when launching a new car. An example of this is Apple Car-play, two years ago there didn't even exist any specification regarding this service. So if a normal project takes three years you understand this isn't easy and we end up late" (Respondent 1).

According to Respondent 2 there are parts of the organization that were against nearly every form of change of the HMI compared to previous generation systems, for example Volvo Cars complete car, but they were not against the project as such. The general approach is too often is that they are afraid to make mistakes and because of that they don't run fully on a concept so it's become right from the beginning. Then it will be easier to make small and slow changes.

According to respondent 1, IT is nowadays all over the cars, and organizational wise Volvo Cars IT department has historically been responsible for managing computers, network and wifi in their offices. Now they are involved in the products that R&D develop and this has created some difficulties regarding responsibility. It's has according to respondent 1 been difficult to manage and make these departments work together because in the organizational hierarchy they don't meet before CEO level. "But in practice we have to find solutions how to work together and there have been some contradictions regarding best ways to do stuff, but so far we have solved this" (Respondent 1). Respondent 1 highlights that managers have to find solutions to this and work with continuous evaluations in order to find best practice of work. And also because of the increased demand for IT in the cars and as a result of this, both It and R&D have grown rapidly.

4.2.7 Lock-ins

It is shown quite clearly that the suppliers of Volvo Cars have difficulties to meet their requirements. The shorter timeframes for delivery also puts demand on them. And it is according to respondent 2 clear that Volvo Cars Car is not ready as an organization to become a software developing company (Respondent 2).

When talking about risks Respondent 1 mentions two concrete examples with implementing new technologies in cars. The first is when building new cars the deadline for car launch is fixed. So it can't be pushed in the future and because of that his department always works with a list of

things that can be cut if they fall behind in schedule. The other thing is the risk with new innovations is how they will be received by buyers and journalist. There is according to respondent 1 always a risk, particular with this new touch based system in the new XC90.

4.3 Connected Vehicle Cloud

The Connected Vehicle Cloud is the backbone service to provide connected in-car-services. It is based on Ericsson's Multi Service Delivery Platform and will provide infotainment, apps and communication services in new Volvo Cars. Volvo Cars clearly sees that cars in the near future will integrate the same level of digital services that consumers today are used to having at home or at work. The Connected Vehicle Cloud is a strategically important part of Volvo Cars investments for the future where they intend to take a leading position (Press Release, Dec 17, 2012 | ID: 47168). Looking at car manufacturers, Volvo Cars is one of few who strategically invest and creates partnerships in cloud-based solutions. “The Volvo Cars solution offers a branded look and feel and the possibility to remotely update content over air and time” (Feb 24, 2014 | ID: 138785).

When asked about the background of the Connected Vehicle Cloud and why it was developed, respondent 3 explained that IT has been a traditional feature of manufacturing companies. Previously, IT was a support function which was both heavy and expensive, and was disregarded even though it was something Volvo Cars needed have. Nowadays however, “IT has suddenly become part of the product and due to the digitalization of services, the Executive management also sees that IT is becoming increasingly important. It is not just the IT inside the car but also making more and more solutions to customers outside the car” (Respondent 3). The idea of having a cloud solution started with Volvo Cars having a number of communication related research projects by which they made contact with a number of people who made them start sketching on increasing the infotainment content in the car. It then became clear to Volvo Cars what was needed outside the car, and then it seemed natural for IT start sketching on it.

4.3.1 Generativity

When asked about the current status of the Connected Vehicle Cloud, respondent 3 explains that even though they now have a cloud, they must also look at other possibilities. The cloud solution available for the cars is deployed and recently expanded with the XC90 with the benefits uploading software to the car and updating a number of new features, and it will come some new functions for future car projects, but from an end-customer perspective, they are not yet finished to put it together globally.

“We now have one cloud for connected cars as well as a cloud which IT maintains for connected cars. We also have a platform for digital communication with customers on Volvo Carscars.com and through MyVolvo Cars, as well as a local Swedish variant which is built on a different technology” (Respondent 3). In addition, they have a mobile app, developed by R&D and not IT,

which means that if they for example would like to do a marketing campaign on smartphones, it is not possible. There are no two mobile apps that are almost doing the same thing as Volvo On Call, one that the market has made and one that R&D has made. Thus, Volvo Cars is not at a stage where they have a digital channel yet (Respondent 3).

When asked what the most valuable factors are for Volvo Cars to have a cloud solution, respondent 3 explained that already having the Volvo On Call application was very valuable. They were on their way to creating a connected car in a higher degree, which they also managed to do. They were able to back the solutions they had already launched and embrace a new way to manage customers since their entire CRM process, customer process and login to the different systems became one and the same. During this first launch, they introduced something called Volvo Cars ID which was to be greatly valuable to them. “This meant that we actually have something we ultimately can tie up future services to, where we have a general logon service, and where customers need to have a login. Previously, the customers needed different logins to all the different services” (Respondent 3).

Connected Vehicle Cloud can in the future enable the cars to collect road status data and share it with other road users and with local authorities. This type of data-sharing will support convenience and life-saving services while also contributing to a better society. “Volvo Cars is currently investigating a whole range of connected car services that could be provided thanks to available in-car data and the Volvo Cars Cloud” (Feb 24, 2014 | ID: 138785). This journey is possible by the evolution of the connected car in a connected society. This type of innovative cloud-based technology can in the future be connected in standardized forms to traffic management ecosystems in different countries and maximizing the sharing of real-time traffic information data. “The strategic focus on connectivity within our new Scalable Product Architecture paves the way for more cloud-based safety solutions. This will bring us closer to our safety vision that nobody should die or suffer serious injuries in a new Volvo Cars car by the year 2020” (Mar 19, 2014 | ID: 141041).

4.3.2 Control

Volvo Cars have not yet lost control regarding what they they implement in the car, both developed by Volvo Cars themselves as well as functions developed externally. “If we are going to build a safe car, we need to continue having control. We have not opened up for anyone to do anything on the screen in the car” (Respondent 3). However, Volvo Cars are aware that they will not be able to maintain control over applications like Apple Car Play. Thus, they need to find new models for how to disclaim themselves towards the customer and explain that “everything you do in this mode, we contain no control over” (Respondent 3). This changes the control, and Volvo Cars needs to trust that Apple is following the requirement from US authorities on how a car must function.

Volvo Cars is according to respondent 3 also seeing the possibilities of allowing other parties to develop code that can be used in the car, where Volvo Cars has a control function it goes through

before allowing anything to be implemented. So far, Volvo Cars has seen themselves as too small to attract the amount of investment required, and they do not yet see the need for this since competitors have tried and failed in the past. But the ability to add or remove services in an ever changing process is a great achievement for Volvo Cars.

4.3.3 Multi-sided networks

When asked what department of Volvo Cars that is involved with the Connected Vehicle Cloud, respondent 3 explained that it is IT that does the specification and development of the cloud for connected cars. However, this is commissioned by, or in interaction with, many part of R&D. All major units of R & D are involved; chassis regarding the safety, powertrain regarding engines, and electricity regarding infotainment and connectivity. Customer service is also involved in relation to the aftermarket; service regarding how the car can be repaired, quality aspects if the cloud goes down, and they also handle services such as Roam Delivery. They also have a lot of dialogue with the finance department because they affect how payment is made.

Respondent 3 explains that everyone seems to be on board with the development, and when a decision had to be made regarding the cloud solution the top management understood that they to say yes to the funding, but they didn't get more involved. Nowadays however, the management communicates to the market that connected services are important for the future of Volvo Cars. "This is something the top management would never have said three years ago, but now they do. The importance of an IT service with good quality was never discussed, but IT is now part of the quality organization" (Respondent 3). People have started to realize that the cloud solution gives Volvo Cars value, and it is used in a lot of marketing purpose.

Since IT and the Connected Cloud Vehicle involves a lot of business units, there are a lot of challenges with suddenly being at the same organizational level as R&D, who becomes dependent on IT, and IT becomes dependent on R&D. According to respondent 3, it has therefore not always been easy to identify who controls who, in relation to IT and R&D. However, being such a small company as Volvo Cars, everyone knows the closest managers and is therefore able to make it work.

4.3.4 Network effects

Volvo Cars has chosen to work together with Ericsson which is a big partner. Respondent 3 explained that Ericsson deliver large parts of the cloud solution, but there are also components that Volvo Cars is the owner of. Volvo Cars saw Ericsson as a player on the market that could handle millions of affecting things surrounding them. Volvo Cars is accustomed to managing 20,000 clients in their IT systems and not 20 million cars around the clock. Ericsson has 5 billion customers and large networks, and that experience and knowledge led Volvo Cars to partner up with Ericsson. This partnership has also given Volvo Cars an opportunity cooperate with Ericsson in several external exposure occasions where they are given the opportunity to be in a context where they normally don't exist. "They see the benefit of us and we see the opportunity to reach out to the media that we normally do not reach out to in that type of event" (Respondent

3). IT channel has therefore become a mediator for the Volvo Cars brand. Volvo Cars know that they are small on markets outside of Sweden and it is therefore important for them to appear on as many new places as possible.

4.3.5 Path Dependency

Respondent 3 highlighted that digital services are turning things upside down for Volvo Cars. Building a car involves physical things that are possible to put a price on, and which are put together in the factory. When a car is rolled out of the factory it's called Factory Complete and the construction of the car is considered complete. But in relation to digital services, Volvo Cars are now asking themselves if there ever can be a date for finishing the construction of a car. Volvo Cars are also considering the factory cost of a digital service, if it emerges when the customer uses it or as a possibility for them to be able to build cars. Traditional software development is not easy for an automotive company (Respondent 3).

During the project, it has according to respondent 3 been obvious that cloud solutions are expensive and complex, but they still manage to deliver a cloud solution despite that there is always a mistrust regarding the costs of IT. In the R&D department of a car manufacturer, they traditionally amortize development costs. A supplier carries out the development, accounting for the costs themselves, while Volvo Cars agrees to buy the developed product. Thus, they remove the charge of development and pays when they purchase the product. The cloud solution was given the same options to not finance development on their own, but this results in a much greater cost for the car instead. This will after several years end up being more expensive for Volvo Cars, which meant that they were easily able to get the project financed. "Now, even the R&D has started to understand that it is better to take the development projects with high upfront cost, because it is cheaper for each component in the future" (Respondent 3).

Volvo Cars are asking themselves if they want to be a product-oriented or a service-oriented business, and respondent 3 highlighted the great journey they have in front of them. Volvo Cars is considering if a product-oriented industry company always have to remain the same, or if they will be able to complement with another business. "How will we in the future handle if large companies, such as Apple, have the possibility to buy us?" (Respondent 3).

4.3.6 Installed Base

In the autumn of 2013, Volvo Cars rebuilt the portals as well as the infotainment in the car to using the same system. But it also meant a simultaneous roll-out to all existing customers using the portals which meant that they had to go in and create a new ID before using it. "It was a difficult process but it was probably the last chance we had" (Respondent 3). If it was to be done now, it would have been even more challenging since the number of users has increased a lot.

Since Volvo Cars is a traditional car-developing company, respondent 3 explains that their culture and the way they are organized is built on them been a car company who sits on top of a value chain, from a B2B perspective. Therefore, Volvo Cars has a clear structure for their

suppliers, which is very classical will persist for building a car. However, the connected world suddenly offers products and services such as Apple Car Play that Volvo Cars can implement in their cars. This means that Volvo Cars must have a dialog with Apple since they have a function that Volvo Cars finds valuable to have in their cars. "But we will never be able to see Apple as a supplier to us because they are 100 times larger than us" (Respondent 3). This means that Volvo Cars are no longer top of the supply chain since Apple will occupy that position. Therefore, Volvo Cars has to make important decisions concerning the structure they will use in a dialog with Apple and Google. Their current structure and culture will not work for very long. There are a lot of actors, including Apple and Google, who consider cars to be underdeveloped and have the desire to do more. Volvo Cars agrees with this, but respondent 3 explains that they learned that some things take time. Hence, Volvo Cars needs to balance how to act agile and fast at a low cost, without the need to transform everything into a five year plan.

4.3.7 Lock-ins

Respondent 3 explained that the IT department has a hard time building a structure that enables effective delivery for upcoming projects. Volvo Cars has every year around 100 projects, called OD project, where every project comprises approximately 2-30 million SEK. In such project there is no possibility to build for the future, and none of these projects can afford build platform. Therefore, they are building a cloud that can be delivered to every upcoming car project. It's the same cloud, but with a different interface. "Instead of spending 2 million for a quick solution, we should spend 20 million to build a platform" (Respondent 3). Volvo Cars has learned a lot in investing in a cloud where it is IT, rather than a specific car project, that makes the investment, and they have now built a global platform that they can continuing developing. It is mostly Volvo Cars that affects the continued development of the Connected Vehicle Cloud, but respondent 3 also explains that there a lot of things happening on the market with connected cars which also affects the development.

4.4 Roam Delivery

The Roam Delivery Service is a new and innovative technology for the automotive industry. However, it has not yet been released to the market but through this service, Volvo Cars enabled the world's first delivery to the car. Hence, no matter where the customers are, they can receive their orders to the Volvo Cars car. In order for the car to become a delivery pick-up and drop-off zone, Roam Delivery uses digital keys. "Having accepted the delivery, he or she then hands out a digital key and can track when the car is opened and then locked again. Once the pickup or drop-off is completed, the digital key ceases to exist" (Press release, 20 Feb, 2014).

The possibility to collect data regarding the location of the car is crucial in order for the Roam Delivery to work. Therefore, Volvo Cars needs to collect both customer-data and car-data. "The customer-data is owned by the customer when it comes to name, address, email and data that very much relate to the person. The collected car-data is more related to the car, regardless of

whom is driving it” (Respondent 5). Roam delivery is based on the functionality of the telematics app Volvo On Call which means that the customer needs to have Volvo On Call in order to use the Roam Delivery service (Press release, 20 Feb, 2014).

4.4.1 Generativity

When asked to explain the background of Roam Delivery and why it was developed, respondent 4 explained that Volvo Cars are looking in to new ways of making money since they are losing money on every car that comes out of the factory. They have seen the possibilities of the aftermarket and know have two options. They must either increase the volume of the cars in order to pay the fixed costs, or they have to do something else. Hence, a workshop was held around two or three years ago where possibilities of connected cars was explored. This resulted in a lot of different thing, and Roam Delivery was one of them. Respondent 5 pointed out that the platform Volvo On Call already has services that are based on data collection, and Volvo Cars are looking in to ways of expanding it. The services offered there today are very technical, but there are both possibilities and desires to do gamification of the already existing data and making new services out of it. With Roam Delivery specifically, respondent 4 explained that they wanted to create a new service in their back-end system through already existing ones. Thus, they would not need to change anything in the car, not even make software updates to it.

Due to a lot of obstacles regarding the desire of customers, the scalability, and potential partnerships, the platform was tested in a small scale which resulted in major media publicity. According to respondent 4, this pilot-version highlighted the problem of making home deliveries to end-customers since 30 % of all deliveries fails. The respondent pointed out that this entailed distinct advantages for both customers and potential partners. The platform could therefore be a possibility for Volvo Cars to increase profit, either by reinforcing the brand and selling more cars, or in some way charge for the use of platform. According to respondent 4, this is also the current stage of the project; how to take it to the market. Regarding the current stage of connected cars, respondent 4 explains that no one dares make the big investment that would solve most problems when it comes to privacy, managing partner, and different integrations, since no one sees that Killer-app. They have to find that app that makes people see the potentials of using connected cars to develop more services. It could be the possibility to deliver orders to the car, or it could something completely different. However, in order for this to happen, respondent 4 thinks that it has to have a clear connection to cars.

When asked what type of processes that have been used, respondent 4 explained that they in the beginning did not follow any processes since it was a quick-and-dirty under the radar. However, since they are now at a stage where they are looking into the possibilities of making Roam Delivery commercial, they have to follow a lot of processes. Respondent 4 points out that they have been asked what car project The Roam Delivery Service should be linked to, but “it is not a car that we are building” (Respondent 4).

4.4.2 Control

When asked about how much control Volvo Cars has over this platform, respondent 4 explained that they contain full control and can pull the plug at any time. If the platform is released, there are some things that Volvo Cars will always want to control in order to ensure safety. “I think we will want to keep certain things in ourselves, and in terms of IP patent, we do not want to make some functionalities available to others. If we build this service right, then it will hardly be visible” (Respondent 4). Hence, the service is supposed to be a natural part of ordering something.

When asked how adaptable Roam Delivery is, respondent 4 explains that the interface built for the pilot was specifically developed in order to locate the car and unlock it, and not to test scalability. Therefore it can't be properly adjusted, and when involving other partners a specific interface needs to be developed for them as well. For further development of Roam Delivery, it is according to respondent 4 up to potential partners and their demands regarding the service. Volvo Cars wants to increase the number of partners and cars, without having to change anything in the car. Since they have the actual connection to the car it makes it very easy to change the way it looks outside. It is also important for Volvo Cars to maintain the functionality and to ensure that the unlocking of the car is always made through them.

4.4.3 Multi-sided networks

It is clear that Volvo Cars know that they can't do this on their own. “In order to make this a permanent deal, we need large delivery partners that have a wide supply range. We can't go to each small company” (Respondent 5). Hence, the first step to releasing Roam Delivery is to first try it out with a global partner. However, respondent 4 highlighted the possibility that a global partner might not be able or willing to utilize the Roam Delivery service globally. Thus, it will be important to release the service market by market. Respondent 5 also explained that even if the customers are finding Roam Delivery a good service, the delivering companies must also value the possibility of making deliveries to the car of a Volvo Cars owner.

There are many companies that have contacted Volvo Cars who are curious and willing to do business. But since Roam Delivery is not yet released, many potential partners are unsure whether they should invest in this kind of service. Volvo Cars must therefore on an increasing scale show that it works. “It is particularly small start-up companies that are willing to take the risk, and they have also come a long way in customer experience” (Respondent 4). Large traditional delivering companies have very critical flows and volumes and it will take time for them to adapt and change. However, these companies are aware that they must do something in order to keep developing. All potential partners also have different value factors, such as a more efficient delivery process, or an interest in the customer base Volvo Cars can offer. A compelling customer base is according to respondent 5 very important to create potential partnerships.

If agreements are established with major partners, there is a possibility that when competitors have the same amount of connected cars as Volvo Cars, they might want the same service. In

that type of a situation, it could be easier for the competitors to collaborate with Volvo Cars that already has agreements with all partners, than to write their own contracts. “I do not think partners want to have dual agreements with every car company” (Respondent 4).

4.4.4 Network effects

When asked in what way Roam Delivery contribute value for Volvo Cars, respondent 4 explains that it has primarily been about PR. Secondly, it has also been an opportunity for new businesses even if you don't make them. “And we must not forget that if we take this all the way out to the market, we have built an ability to do something other than building a car” (Respondent 4). Thus, the project itself has given Volvo Cars a lot of great lessons for launching new services for connected cars. Respondent 5 also highlights that it's not about gaining any revenue, it's more about brand value and adding value to the existing car by having this service added on. However, building up the brand value and the value of the car will eventually generate revenue for Volvo Cars. Instead of making money out of the specific service, the business case for Roam Delivery is about giving convenience to the owner of a Volvo Cars car.

Regarding how Roam Delivery can provide customers with value, respondent 4 explained that people will find it sufficiently convenient to get goods delivered this way instead of having to go to a postal-office or needing to be home in order to receive a delivery. According to respondent 5, one way to attract and gain more customers is the possibility of selecting the car as a delivery point, instead of the home address, which might be a convenient choice for the customer. The real challenge for Volvo Cars is to find incentives that will make the delivering companies value deliveries of this type.

When asked how Roam Delivery is going to expand and grow, respondent 4 explained that it can be done in two different directions. One direction is to get more customers by either selling an accessory connecting more cars (not only Volvo Cars), or by an agreement with a competitor so they can enter our environment. The other direction is to start with one partner and then gradually connect more potential partners. Another important aspect is PR. Regarding the technical aspects of releasing Roam Delivery, respondent 4 explained they could in a short amount of time build a system that would quickly enable this service. However, their most challenging part to release Roam Delivery is finding and agreeing with partners.

4.4.5 Path Dependency

When asked of the objectives with Roam Delivery, respondent 4 explained that the main goal is to release the service, but also for Volvo Cars to learn how to deliver this type of service. This is identified as extremely important in the long term. Business wise, they also need to decide if it is a platform and service that can make Volvo Cars and Volvo On Call more attractive, or if it is also something earn money of. However, respondent 5 explained that Volvo Cars will always do what they think is best for the customer and not sell personal data for the only purpose of earning money.

When asked of the future plans are, respondent 4 explained that Volvo Cars as a car company are accustomed to focusing on not doing anything wrong rather than doing it right. Thus, Roam delivery is part of an iterative process where Volvo Cars gradually learn about the services surrounding the connected car. “The road to having a full ecosystem is not straightforward and we don’t know what the next big thing is; if it’s Roam Delivery or something else” (Respondent 4). Hence, Volvo Cars has identified the importance of being flexible, agile, and able to test things in a satisfying way.

According to respondent 5, there are a lot of different opinions in the organization regarding Roam Delivery. Some people think that it should be sold as a concept outside Volvo Cars, but for Volvo Cars it’s more about building a brand than making a profit. “Everyone talks about it since it was such a nice idea, but I don’t think that Volvo Cars will be the only player in the world that has this type of service” (Respondent 5). There are a lot of possibilities in the area of locating and unlocking the car, and since the car stands still a lot, there are several other services that can be utilized in the future.

4.4.6 Installed Base

When asked what the biggest challenge is with Roam Delivery, respondent 5 explained that they are trying to decide if it’s a service for all markets. In Sweden, Volvo Cars is the largest brand with 20 % of the market. But outside of Sweden, they don’t have the same market share. “If we go to Italy where we are a 1 % brand - if they have a food delivering service there, would they be interested in doing this with Volvo Cars? I’m not so sure” (Respondent 5). It is important too not only look at the platform as a grocery delivery service, as it was displayed in the pilot, but as a concept that makes it possible to deliver things to the customers car.

According to Respondent 4, there is no financial reason why the Roam Delivery service not yet is released, and even the CEO is eager to bring Roam Delivery to the market. However, Volvo Cars is built upon putting steel into one end and car out of the other, and a lot of other stuff in between. Developing a service is however something completely new. Therefore, there have been frictions between some areas. Respondent 4 highlights that even if it sound great with innovations, once it’s actually being done in large companies no one really wants to deal with it. Roam Delivery also changes the way Volvo Cars is selling cars since they could charge the end-customers or delivering companies directly. Volvo Cars also needs to consider what type of company they want to be. “Do we want to be a company that sells cars, like all the other car companies, or is this service a way to increase the desire to buy a Volvo Cars car? Or should this become a new business?” (Respondent 4).

When asked what the biggest concerns are, respondent 4 explained that it involves security aspects when someone else can open a customer’s car. It also involves privacy, for if Roam Delivery is released, the location of the customer needs to be shared to a third party. Hence, it is important have the customer in any way approve it. “So if the customer wants this new service, then off course we use this data, but it always has to be in consent with the customer”

(Respondent 5). Respondent 4 also explained the potential risks of intrusion, both regarding their central server and against cars. Also, if a valuable package is delivered and left in the car it increases the risks of burglaries which will reflect badly on Volvo Cars. Finally, there is always the risk of customers not wanting to have the service.

4.4.7 Lock-ins

The parts of the organization that are primarily involved in Roam Delivery are Marketing and Sales, and IT. There are also follow-ups with certain part of R&D and the Swedish Sales Company. According to respondent 4, the development of Roam Delivery has interfered with the way Volvo Cars normally works when building a car. “We are used to doing business in a certain way, and we have tough process for it to work in that certain way. All car companies converge to a type of organization, a certain amount of profit” (Respondent 4). All departments are usually involved in the project from the beginning and approves its development, R&D then does the work and MSS Connectivity, where respondent 4 works, joins in again when it’s going to be sold. However, the Roam Delivery project gets inhibit when everyone needs to be involved and no one seems willing to make any decisions. People either refer to someone else or question why they should do it, which results in the project being postponed another month. Respondent 4 points out that there is a good chance that they will end up on the five-year sprint to deliver a new car, and they would in that case lose all their advantage. In order to keep the momentum, the developers of Roam Delivery have learned not to involve other parts of Volvo Cars in the beginning, and later on decide who needs to be involved. The ones that are not chosen to be involved are often the ones that oppose the project, since it do not follow the usual process.

It is the Connectivity manager along with the IT manager that affects the continued development of Roam Delivery. Respondent 4 highlights that the project is well established in the top and bottom of the organization and the CEO and the IT manager are *on board*. However, there is a gap with the middle managers that don’t have a direct connection with the project but might still affect it.

5. Analysis and Discussion

In this section, the empirical results are analyzed and discussed in relation to the theoretical framework of the study, with an emphasis on the Competing Values Framework. Hence, the concepts used within the theoretical framework and the empirical data will be broken down and interwoven since the discussion will focus on the three different platforms.

5.1 Volvo Cars as an organization

Activities that create value in the Focus quadrant include continuously improvements in efficiency by implementing better processes. The organization pace is better, cheaper and safer. Organizational effectiveness is gained through efficient processes, measurements and control. Value creation is managed by statistical processes, control and quality management to make the organizations function more smoothly and efficiently (Cameron et al., 2006). All these examples are how Volvo Cars work with improvements in their regular organization, that aren't any platforms. Thus, we have positioned Volvo Cars in the Focus quadrant of the Competing Values Framework. Volvo Cars has a big legacy of how they manage their organization and work to achieve efficiency. Volvo Cars can be viewed as a traditional product development company with all that it involves regarding classic R&D processes, supply chains and hierarchy. New innovations for example take time to put in production, they need to go through Volvo Cars developments processes which involve many opinions from different departments and they also need to be funded in a project. This is why the product development time for a car could be around five years. All this history which affects their way of developing new technologies and products at Volvo Cars can according to Hanseth (2001) and Zhu et al. (2006) be explained as path dependency. Path dependency means that previous experience has a great impact on the strategic planning for future investments. And if a product development firm has an extreme case of path dependency and ceases to investigate new capabilities, it may never adapt and exploit new information in a quickly moving field, such as digitalization.

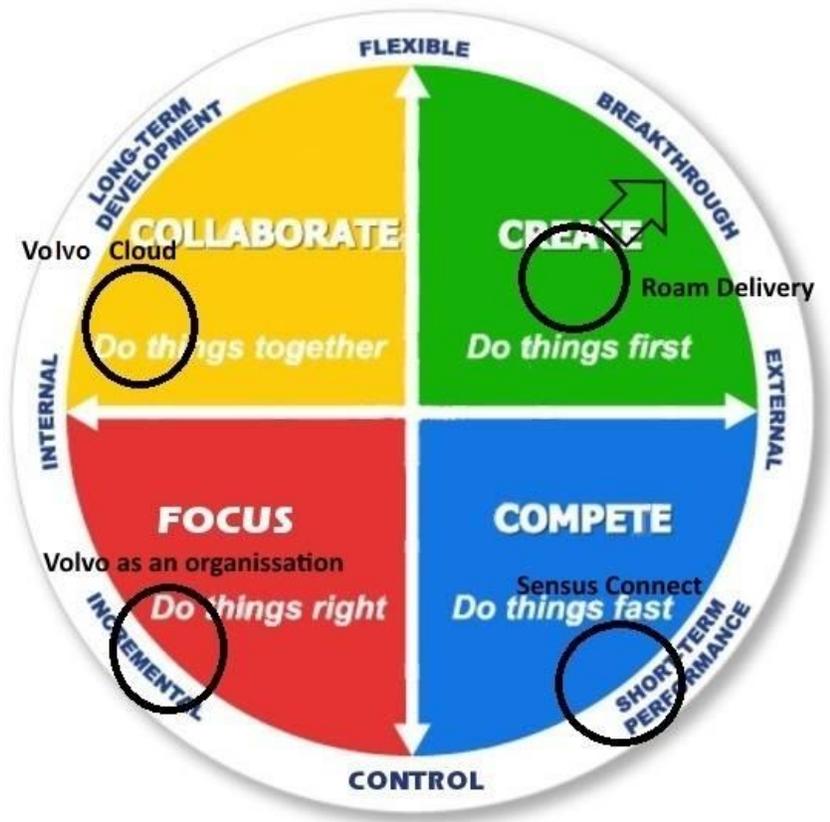


Figure 3: Illustration of the Competing Values Framework based on Cameron and Quinn, (2006) and Cameron et al. (2006), with the digital platforms.

5.3 Sensus Connect

Sensus Connect is the platform for Volvo Cars new infotainment system which provides information, entertainment and features that simplify car ownership. We place Sensus Connect platform in the organizational field Compete in the Competing Values Framework. According to Cameron et al. (2006) value enhancing activities in the Compete quadrant is a result of the pursuit of competitiveness. Organizational focus is on effectiveness and core values in a compete organization are competitiveness and productivity and this is obtained through strong emphasis on external positioning and control. This culture built on the assumption that the market isn't friendly but hostile (Cameron & Quinn, 2006). They have developed this platform to fast changing market demands and they are aware of these new demands because they got an external view on what's happening around them.

Speed is according to Cameron et al. (2006) a core element of keeping up with the competitiveness in the global market and a demand for companies in this quadrant is results right

now. This equals a lot to what Volvo Cars is doing with their app developments in Sensus Connect. They are focused on generating new applications that is demanded by the car users. Connectivity and mobile interaction is a rising demand to day and to keep up with this they are now introducing Apple Car-play in the Sensus Connect platform for the first time. A aggressive way to find organizational effectiveness with competition and customer focus, as explained by Cameron et al. (2006).

Other examples of value creating activities significant with the Compete quadrant includes outsourcing selected aspects of production or services, investing in customer acquisition and customer service activities, and attacking competitor organization's market position (Cameron et al., 2006). This activities match well with Volvo Cars strategies for Sensus Connect. They got a lot of outsourced functions regarding development of applications. With Sensus Connect they enable new ways to interact with their customers and keeping them closer to the Volvo Cars brand. Ever since the car became connected, Volvo Cars now have a direct contact with the customer in the car. The car is part of the digital platform, just like the smartphone is. One example of this is the connection that is enabled through the connected car with booking services in a Volvo Cars dealer automatically when the time is up for servicing the car or just makes the life easier with new technologies.

In the Compete quadrants success is measured by indicators such as market share, revenues, meeting budget targets, and growth in profitability position. And speed of action is keys to value creating activities (Cameron et al., 2006). This things are close related to Volvo Cars goals with Sensus Connect to gain market shears by increase to value of owning a Volvo Cars and by generate more value they can also ensuring a higher price on the car with in return strengthen the revenue.

Entering this environment of the Compete quadrant is something relatively new for Volvo Cars. The platform Sensus Connect was launched because their competitors had introduced connectivity in their cars. Hence, Volvo Cars entered the Compete quadrant in order to make a fast move and enter the competition of connected vehicles. In order to create a successful infotainment system, Volvo Cars need to create partnerships for third-part developments, but since Volvo Cars creates their own applications and do not want to lose control. This leads to tensions and contradictions in this new way of competing against the traditional way of doing everything in house and having full control over future development.

5.4 Connected Vehicle Cloud

The Volvo Cars cloud platform was developed by the increasing demands for connectivity in the cars. It is today the backbone service provider to connected in-car-services and provides infotainment, apps and communication services in new Volvo Cars. It is a long-term solution that enables Volvo Cars to provide services both inside and outside the car, after it is developed in the

factory. In this regard, the digital platform initiative Connected Vehicle Cloud can be placed in the Collaborate quadrant in the CVF. As mentioned by Cameron and Quinn (2006), this type of organizational form focuses on shared goals and values, cohesion, participation, individuality and a sense of team feeling in the organization. This is in some ways what Volvo Cars enabled by when integrating the IT-department in the development of the digital platform Connected Vehicle Cloud. Due to the digitalization of services, the Executive management has according to respondent 3 also seen that IT has become increasingly important. When it became clear to Volvo Cars that they needed to increase the infotainment content outside the car, then it seemed natural for IT start sketching on it.

The Connected Vehicle Cloud supports the ability to do things internally together at Volvo Cars to enable new digital services, with internal flexibility but a lot of control for externalities. The development of Volvo Cars Connected Vehicle Cloud has enabled a new way of managing project at Volvo Cars and created more flexibility in the organization, this was done because the Connected Vehicle Cloud was a big innovation project that wasn't managed by R&D. No regular car project was able to take the whole cost of building such a platform for the future. Instead it was the IT department that became the owner of the project, instead of developments cost being fixed to a specific car projects. IT developed a platform the normal car projects could benefit from this in the future and at the same time lower their development cost by the ability to reuse the platform. This was a big innovative way to do new collaborated organizational project at Volvo Cars. This is consistent with the strategies of the Collaborative quadrant explained by Cameron et al. (2006) where effective and long-lasting partnerships across organizational boundaries, both inside and outside of the organization, is required to create long-term success. Something that Volvo Cars seems to have understood.

In order to make this platform as effective as possible, they have also created a successful collaboration outside their organizational boundaries which shows their willingness to cooperate. Volvo Cars has chosen to work together with Ericsson who delivers large parts of the cloud solution. Hence, Volvo Cars is collaborating with Ericsson in order to gain their experience and knowledge in order to create the best possible platform.

Entering this type of organizational form and opening up to collaborations is something relatively new for Volvo Cars as we saw in the results. Respondent 3 explained that their culture and the way they are organized is built on them been a car company who sits on top of a value chain, from a B2B perspective. Therefore, Volvo Cars has a clear structure for their suppliers. The fact that IT now has a larger influence of the future development of a Volvo Cars car, it creates new forms of inter-organizational collaborations. This leads to tensions and contradictions between how traditional projects and developments are made at Volvo Cars. For example, Volvo Cars traditionally have every project connected to a specific car and are also founded through each car development, but The Connected Vehicle Cloud is a cross functional project with no traditional ways of founding and involvements of the R&D department.

5.5 Roam Delivery

The Roam Delivery Service enabled the world's first delivery to the car and no matter where the customers are, they can receive their orders to their Volvo Cars car. This is a new and innovative technology which has emerged as a result of the digitalization, as a way to see new possibilities of creating value and satisfying customer in new ways. Important to highlight is that it and has not yet been released to the market, and is viewed by Volvo Cars as a successful innovation that gave them a lot of knowledge in creating these types of digital platforms.

It is clear that the digital platform initiative Roam Delivery can be placed in the Create quadrant in the CVF. As mentioned by Cameron and Quinn (2006), this type of organizational form focuses on innovation and pioneering to become successful, with the purpose of developing new products and services for the future. This is exactly what Volvo Cars were aiming for when developing the Roam Delivery service. It was according to respondent 4 a result of looking into the possibilities of connected cars and the potentials of creating new services to the aftermarket. When an organization is focusing on strategies in this quadrant, it enables them to create a great advantage over their competitors and achieve innovative performances (Cameron et al., 2006), which is something Volvo Cars were able to do with the Roam Delivery. It created a lot of positive publicity and there are according to respondent 4 many companies that have contacted Volvo Cars who are curious and willing to do business.

The key behind this organization culture is according to Cameron and Quinn (2006) ad hoc, the meaning of implementing something temporary, specialized and dynamic, which also seems to be true for the current state of the Roam Delivery service. It is a new and innovative technology for the automotive industry that is very specialized since the only focus in the pilot version was to make grocery deliveries to the car. In addition, it is dynamic in the sense that it is possible to expand this digital platform and open up to more services that can be enabled by locating and unlocking the car.

According to Cameron and Quinn (2006), the long term goals of this quadrant are rapidly growth and acquiring new resources. However, the long term goals for Volvo Cars with the digital platform Roam Delivery are according to respondent 4 to learn how to deliver this type of service. This implies that the digital platform Roam Delivery can be viewed as a first attempt for Volvo Cars to try and enter the Create quadrant. The ones that become successful are those who according to Cameron et al. (2006) conduct thoughtful experimentation, learning from mistakes, and failing fast in order to succeed more quickly. However, the idea of Roam Delivery was great, as mentioned by respondent 5, but Volvo Cars inability to release it makes it hard for them to fail fast and learn from their mistakes.

Entering the environment represented by the Create quadrant, there are a lot of risks. According to Cameron et al. (2006), the possibility of creating new value can offer a lot of potential payoffs,

but it can also result in failure. This seems to be something that Volvo Cars is aware of which could also be one of the reason why they are unable to release the Roam Delivery to the market. Entering this type of organizational form is something completely new for Volvo Cars. As a traditional product development firm, Volvo Cars are usually found in the opposite quadrant to Create, namely the Focus quadrant, which until now has not affected the development of the platform. However, when looking into the possibilities of releasing this platform to the market, the traditions of Volvo Cars are resulting in some tensions and contradictions. For example, Volvo Cars wants to do things right with low risk but in order for an innovative platform like Roam Delivery to become successful it is dependent on the possibility of creating first move advantage and make a breakthrough on the market.

5.6 Strategizing at Volvo Cars

The three digital platform initiatives have now been placed in the Competing Values Framework based on their current status. Considering the purpose of this study, it is therefore necessary to discuss how Volvo Cars as a product development firm is balancing generativity and control when managing these digital platforms.

The first dimension in the Competing Values Framework differentiates the criteria for effectiveness that contributes to flexibility, discretion, and dynamism, from the criteria that contributes to stability, order and control (Cameron & Quinn, 2006). In relation to this study, this implies that there are two ways to be effective when managing digital platforms. They can either be effective by being changeable, adaptable and organic, or they can be effective by being stable, predictable and mechanistic. When looking at the three different digital platform initiatives in relation to this first dimension of the CVF, they are all managed differently. Sensus Connect is close to control in the dimension control versus flexibility. This digital platform got flexibility in one way regarding that it is developed to work in every car that is in Volvo Cars range. However, organizational wise this digital platform is low on flexibility since it shows how Volvo Cars want full control off all applications that are being allowed in the platform. The Connected Vehicle Cloud can be viewed as having a high grade of flexibility since it can support any Volvo Cars car with just a few modifications, and it enables new capabilities to be added after a product has been designed and produced. However, Volvo Cars has made a clear statement regarding control over the Connected Vehicle Cloud and they will not open up for anyone to do anything on the screen in the car. They have the ability to open up and let third-parties join in, but at the same time they want full control. Roam Delivery can in relation to this dimension be viewed as both flexible and controlled. It is flexible in a sense that it can be adjusted to fit many partners, and it also has the ability to open up to more services that can be enabled by locating and unlocking the car. Thus, they can listen to the demands of the customers and develop new services on the platform, without it affecting the development of the car. Volvo Cars also have a

lot of control regarding this platform since they decide which partners are allowed to join the platform, and what those partners are allowed to do with the car.

The second dimension in the Competing Values Framework differentiate effectiveness when managing a digital platform based on if it supports integration, external orientation, differentiation, rivalry and a consistent way of doing business, or based on if it focuses on interacting or competition outside their boundaries with global goals and local knowledge and has adoptable units (Cameron & Quinn, 2006). When looking at the three different digital platform initiatives in relation to this second dimension of the CVF, they are all managed differently here as well. Sensus Connect is built to serve internal innovations and new technologies developed for their cars. But this platform also allows and has possibilities for external technologies to be used in the platform. Best example of this is that Sensus Connect supports Apple to enter the ecosystem of the platform and run their application on the Sensus Connect platform. They have developed Sensus Connect to fast changing market demands and they are aware of these new demands because they got an external view on what's happening around them. The platform is build to serve Volvo Cars-in-car application but has the ability to take in third party developed applications. The Connected Vehicle Cloud is adjustable to new services that are developed for in-car use which makes it internally effective, since Volvo Cars themselves can decide what capabilities to add to the platform. This becomes more evident since Volvo Cars externally has a high control over the platform which could eventually make it hard for them to meet the needs and desires of customer. Roam Delivery has in relation to this dimension a highly external focus since this is a service that would not be possible without integrating external partners. Volvo Cars will never be able to deliver services on this platform on their own.

5.7 Generativity

Zittrain (2008) has developed five principles regarding what makes something generative. (1) How extensive a system or technology leverages its tasks? (2) How good can it be adapted to its tasks? (3) How easily can people that want to contribute do it? (4) How available the system is to those who want to contribute? (5) How easy it is to transmit the change to others and especially to those who are not the experts?

If we compare these five principles with the three digital platforms at Volvo Cars we can obviously see differences between them regarding how generative they are. Looking at the first point Sensus Connect and Volvo Cars Vehicle Cloud leverages its task to fulfill new technology solutions, Roam Delivery on the other hand cannot be leveraged since it has not yet been launched. Second regarding how adapted the platforms are to their task we can see a clear adaption in all three platforms, they all serve the tasks they were developed to manage. Third regards how much people can contribute to the platforms. The Volvo Cars Vehicle Cloud does not allow any external parts to contribute, Sensus Connect has just recently started to allow

external contribution as in the example with Apple and Roam Delivery built on contribution from external parties to provide the service to Volvo Cars. On the fourth point we can say that anyone that wants to contribute cannot do it without Volvo Cars's permission and when allowed Volvo Cars wants to be in full control. The last point how easy the change is transmitted to others, there is a high risk of all the innovations in the platforms does not generate value or how they are received by the users. Changing a lot in the platforms can make it harder for users that aren't used to new technology. And the challenge is the same for all the three digital platforms in this case.

The balance between generativity and control is reflected clearly in how the different platforms are at Volvo Cars. Sensus Connect is built with full control and an internal focus, where external parties can join based on Volvo Cars's regulations. Connected Vehicle Cloud is built and designed to be flexible and adaptable with the ability to add or remove features or cars. Roam delivery is in between those where the focus has been on flexibility and adaptation to external factors that affect and will affect Volvo Cars in the future.

Volvo Cars needs at the strategic level to discuss how much control they will have over their platforms. Several people at managerial levels with the vision that Volvo Cars should become a software developing company, but it is difficult for such a small company to compete with the giants in the market such as Apple. It is therefore important to consider how to increase the generativity on Volvo Cars's platforms to take in applications and features developed faster in the market than what Volvo Cars itself can manage. This is important to continue to be competitive and create value. It is possible for actors like Apple to take over the role of platform owners in ecosystem and become a focal actor because they have more collaboration with app developers which Volvo Cars has not, since they themselves control and develop their own apps. For this not to happen, Volvo Cars must dare to let go of control, and open up third-party developers.

6. Conclusions

The purpose of this thesis was to answer the following research question: *How do product developing firms balance generativity and control when developing digital platforms?*

With the help of the Competing Values Framework, the analysis showed that the different digital platforms were all founded in different quadrants. This implies that by having multiple platforms in each quadrant in the CVF, it gives a product development firm the opportunity to balance generativity and control. This can be done by having; one platform built with full control and an internal focus where external parties can join based on the firm's regulations; one platform built and designed to be flexible and adaptable with the ability to add or remove features or cars; one platform that is in between the other two platforms and where the focus is on flexibility and adaptation to external factors that affect and will keep affecting the product development firm in the future. Thus, by existing in the each of the quadrants, a product development firm is able to meet the demand of customers and the increasing competition caused by digitalization. It is also necessary for a product development firm to know where their platforms are positioned, in order to find the right prerequisites to bringing the platform project forward and therefore finding the right balance for forthcoming development of digital platforms.

6.1 Recommendations

As seen in the case with Volvo Cars and their digital platform initiatives, there is an organizational legacy that affects how the contradictions between generativity and control are managed. The digitalization of products has a big impact on product development firms that compete in new ways to generate value. One way to overcome or let leave this legacy behind is to develop multiple platforms. In order to build successful digital platforms, product development firms need to generate network effects. To understand how companies platforms are positioned it is important to understand how strategic decisions impact on how platforms are built and how organizational culture affects how generative they will become. And a good way to find this is by using the CVF.

Since this research is a case study only has a focus one single product development firm it could be interesting for further research to investigate how this strategies of developing platforms differ among different product development companies. Another aspect regarding balancing generativity and control in platforms is to look at how software companies manage this, because generally the don not have the same legacy as a product development company with all standardized processes, hierarchy and departments.

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Appendix A: Interview Guide

PERSONLIG INFORMATION

Kan du börja med att berätta lite om din roll på Volvo Cars?

Var i organisationen?

Hur länge har du jobbat där?

NUVARANDE STATUS OCH BAKGRUND

Vart i projektet befinner ni er nu?

Hur /och varför startades projektet?

Vilka incitament fanns?

Vilka var de största värde-faktorerna vid utformandet av roam Sensus Connect?

På vilket sätt har ni jobbat med att vara effektiviva gällande arbetet med plattformen?

Vilka typer av verktyg och tekniker har ni använt?

MOTSÄTTNINGAR/UTMANINGAR

Vilka delar av organisationen är involverade i plattformen?

Finns det delar av organisationen som är för och andra emot?

Kanske vissa till och med motarbetar?

Vad har det funnits för motsättningar i vägen längs projektets gång och hur har det påverkat lanseringen av plattformen?

Vilka har varit de största utmaningar?

Vad har ni för riskfaktorer, och hur hanteras de?

Vem påverkar den fortsatta utvecklingen av Plattformen?

Vad finns det för krav?

Varifrån kommer kraven?

Hur ser arbetet ut för att möta de kraven?

På vilket sätt tillför plattformen värde för Volvo Cars?

Hur säkerställer ni att plattformen ger värde för kunderna?

Hur mycket kontroll har Volvo Cars över denna plattform?

Hur mycket kontroll vill ni ha?

Hur ska ni behålla kontrollen, sett till att många andra företag kanske vill gå med?

Hur ser arbetet ut kring app-utvecklingen? (Endast för Sensus Connect och Volvo Cars Cloud)

Vilka styr det?

Vad finns det för motsättningar? Är alla överrens?

Hur pass anpassningsbar är plattformen och hur påverkar detta det fortsatta arbetet?

Hur lätt är det att koppla nya företag/samarbetspartners till plattformen?

Hur ser arbetet ut med att skaffa samarbetspartners ut?

Hur lätt är det att få gehör?

Delar de era ambitioner?

Värdesätts samarbeten, från båda hållen?

FRAMTIDEN

Vad är era mål med plattformen?

Finns det strategiskt stöd i organisationen för detta?

Hur ser framtidsplanerna ut?

Hur ser det fortsatta utvecklingen ut och hur bevaras hållbarheten?

Appendix B: Information document to respondents

The study we are conducting is specifically aimed at the struggles that product development firms are dealing with due to digitalization. Since digital technology is causing attention-grabbing changes in the automotive industry where cars are increasingly becoming more connected, we find it especially interesting to explore how Volvo Cars are building strategies in order to establish and sustain digital platforms, which are defined as “the foundation of products and services that connect groups of users in multi-sided networks”.

Digital technology has made it possible to build and cultivate a culture that stretches beyond local boundaries which are causing product developing firms, such as automotive manufacturers, to embrace multiplicity and functional variety. Additionally, firms nowadays innovate by creating platforms rather than single product, as way to exploit the flexibility enabled by digital technology. When creating new platform strategies, product development firms must embrace that digital markets are becoming multi-sided, in order to create value from multiplicity.

However, managing digital platforms and multi-sided networks entails a lot of strategic challenges and platform providers are still struggling to establish and sustain their multi-sided networks. This implies that even though product development firms are embracing the possibilities of digital platforms and multi-sided networks, there are still a lot of challenges and contradictions to deal with regarding digital technology. This is a result of the fact that established product development firms have accumulated their knowledge and capabilities in the prior industrial technology and its focus on product innovation. For product development firms it has been proven difficult to transform innovation norms and practices in order to manage digital technology. Since digital platforms have become a key element for innovations with digital technology, we have found it interesting to further investigate how product development firms are managing and developing platform strategies. To conduct our study, we want to investigate three different services more closely, that we have identified as digital platforms. These three platforms would be; Sensus Connect, The Connected Vehicle Cloud (Volvo Cars Cloud), and The Roam Delivery Service. More specifically, we want to highlight the process of how a product development firm, such as Volvo Cars, is managing internal vs. external tensions, and flexibility vs. control tensions of the digital platform when building strategies.