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Master's degree project in Innovation and Industrial Management

***Innovative Revenue Models and their influence on the
components of the Business Model***

A multiple case study on global manufacturing firms

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“A successful combination of a great Business Model and Revenue Model results in a Google of today or a Facebook of tomorrow. But if you place your Revenue Model on the throne and crown it as king, with your Business Model as its slave, then you will land up with a Myspace of yesterday.”

Alok Keyrival, Digital entrepreneur

INNOVATIVE REVENUE MODELS AND THEIR INFLUENCE ON THE COMPONENTS
OF THE BUSINESS MODEL

by William Bratt and Viktor Dynefors

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ABSTRACT

Background: Manufacturing firms have developed innovative revenue models (IRMs) that are connected to their product-service offering, as a new way to differentiate. These new revenue models are dependent on usage, performance, or value delivered to the customer. The value proposition becomes connected to the actual input or output of the customers' own business operations. Thereby, the customers' experience value from being exposed to less risk since the service they are acquiring is adapted to their own business model (BM). However, these IRMs create several complications for manufacturing firms, which is why several have struggled with the implementation, and some even failed. The current academic papers provide a vague explanation of how manufacturing firms are affected when implementing an IRM.

Purpose: This study aims to provide guidance for manufacturing firms in how their BM will become affected when implementing an IRM. **Research Question:** *How are the Business Model components of large global manufacturing firms influenced when implementing an Innovative Revenue Model?*

Methodology: A qualitative strategy with an abductive approach has been chosen since the study investigates how the different BM components are influenced when implementing an IRM. To acquire a deeper understanding a multiple case study based on semi-structured interviews has been conducted.

Findings: The study has found influences on the BM components that the current literature has been unable to explain, which further highlights the difficulties in understanding the influences an implementation of IRMs creates. For example, the case companies mention the need for developing capabilities of appropriate monitoring of the contracts through business case owners and diverse ways of how to manage the distribution of spare parts and replacement products. Furthermore, IRMs will lead to more complex accounting due to the uncertainty in the revenue streams, and highly automated administration is required to not letting an administrative burden erode the business case.

Conclusion: A comprehensive framework has been created of how the diverse BM components are influenced, and the influences for some of the components are highly dependent on the company characteristics prior to the implementation of an IRM. However, the value proposition, revenue streams, and cost structure has been found as the most influenced independently on company characteristics, which can be explained by the fact that these components are related to the revenue capturing process. Furthermore, funding the revenue model, product knowledge, cost awareness, contract management, and efficient administration are considered as prerequisites for implementing an IRM. Additionally, the study has found that IRMs enable the customer to avoid the IFRS16 regulation which creates a potential for highly profitable business cases.

Key search words: *Innovative Revenue Models, Usage-based, Performance-based, Value-based, Business Model Canvas.*

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DEFINITIONS

The following is a description of words and abbreviations. This to gain an early introduction and understanding of the definitions used in this study.

Business Model (BM): Describes the rationale of how a company creates, captures and delivers value.

Business Model Canvas (BMC): A framework created by Osterwalder and Pigneur to express the business model of a firm.

Downtime: An industry term for the time during which a machine is not operational.

External dealer: A dealer that is not owned by the manufacturing company.

Innovative Revenue Model (IRM): Involves value proposition characteristics with a focus on the input/output for the customer, where contracting has a central role and the ownership stays with the supplier. This creates a higher degree of complexity, where the revenue streams are likely to vary since the outcome of each contract is unknown in advance. Different IRMs are *Usage-, Performance/Outcome-, and Value-Based revenue models.*

Large firm: A company with more than 1.000 employees and a turnover of more than 5.000.000.000 SEK.

Manufacturing firm: A company that is producing merchandise to sell.

Original Equipment Manufacturer (OEM): An entity that assembles the end product.

Product-Service-System (PPS): A service offering, where the product is combined with services to jointly fulfill the needs of the customer.

Revenue Model (RM): Describes how the company generates revenue from the value it has created for the customers and is considered as a central part of the BM.

Solution offering: Offerings of a product/service with belonging needs of maintenance that is bundled in a package.

Traditional Revenue Model (TRM): Involves value proposition characteristics with a focus on a product or service. Lower complexity where the revenue streams are known in advance. Examples of TRMs are *Product Sales, Rent, Leasing or Licensing, Cost-plus, and Fixed fee.*

Uptime: An industry term for the time during which a machine is operational.

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1. INTRODUCTION

The introduction will introduce the reader to the topic of this master thesis. Additionally, it will present the purpose, research question, contributions, and delimitations of the research.

1.1 BACKGROUND

Due to the ongoing globalization, manufacturing firms are facing an increased amount of new challenges which require innovative ways of how to create, capture and deliver value, hence affecting their business model (BM) (Meier, 2013; Sousa-Zomer et al., 2018). Just selling a product is no longer sufficient to satisfy customer needs, adjustment or innovation of the BM have become the result of the strive to create specific value for the customers (ibid). On later days, manufacturing firms have started to offer new service-oriented BMs with the value delivery of a product-service-system (PSS), which is a combination of products and services to jointly fulfill the user's needs (Barquet et al., 2010; Van Ostaeyen, 2014; Töytäri et al., 2015). Another step in how some larger manufacturing firms have started to provide value for their customers is by connecting the revenue capturing process to the PSS, where the revenue model (RM) is based on the input (*usage level*) or output (*performance or value level*) for the customers (Bonnemeier et al., 2010; Böhm et al., 2016; Gebauer et al., 2017a). These RMs are triggered by the customers' needs of flexibility to accurately follow up costs and match to their operations (Ng et al., 2013; Gebauer 2017a). An example is Atlas Copco's Contract Air Service, where the usage of an air compressor is sold per m³ of compressed air delivered (Van Ostaeyen, 2014).

By connecting the RM to the input or output of the customer's operations, manufacturing firms need to adjust their BMs (Gebauer et al., 2017a; Visnjic et al., 2017). The manufacturing firm can for example no longer incentivize downtime of their products or weak construction to boost their aftermarket sales, hence the way they are creating, capturing and delivering value is changing (ibid). Usage-, performance- and value-based RMs are categorized as Innovative Revenue Models (IRM) and are suggested to provide more value for the customers' operations compared to Traditional Revenue Models (TRM) which are based on upfront sales, rental or leasing (Bonnemeier et al., 2010; Visnjic et al., 2017).

In September 2003, Rolls-Royce signed a contract for marine engines with the US Navy, where the RM was based on the input for the customer, determining that the US Navy only becomes financially affected with a fixed price per running hour (Smith, 2013). Rolls-Royce guaranteed a specific uptime and ensured necessary maintenance and repair, and if the uptime was not met, Rolls-Royce faced penalties. This concept by Rolls-Royce is named "Power-by-the-hour" (Rolls-Royce, 2018), and illustrates a shift in the RM, where Rolls-Royce previously sold the engines upfront (TRM) to currently charged per running hour (IRM) (Smith, 2013).

The increased competitive landscape and requirement from customers have made several large manufacturers including Hitachi, Michelin, and Caterpillar to shift from a TRM to an IRM (Van Ostaeyen, 2014; Visnjic et al. 2017). However, several firms have been struggling in their

transformation process due to the complexities as the problem to correctly measure the usage and performance of their product (Gebauer et al., 2017a; Sousa-Zomer et al., 2018). The technological development of sensors and connectivity is argued as a contributing factor to the dispersion of IRMs since firms easier can analyze and predict usage patterns, performance and costs over the offered product life and contract time (Gebauer et al., 2017a; Rolls-Royce, 2018).

The IRMs are suggested to provide value for the customers in several ways including; enhanced flexibility, cash management, cost consciousness, convenience, and affordability (Bonnemeier et al., 2010; Teece, 2018). At the same time, the supplier is motivated by the ability to capture higher value from all the supporting activities through locking-in the customer in e.g. usage-based contracts over a certain time period (ibid). Different IRMs are thereby likely to be appealing for organizations aiming to generate profits from additional services and where the aftermarket service sales have a big influence on the company's profit (Bonnemeier et al., 2010; Gebauer et al., 2017a; Gebauer et al., 2017b). IRMs create a business environment based on a win-win situation where the focus is to maximize the captured value for both parties, hence align the incentives between the supplier and customer (ibid).

1.2 PROBLEM DISCUSSION

Bonnemeier et al. (2010) and Reim et al. (2015) argues that IRMs are likely to create more value for the customers as well as open up for new customers, but at the same time generate new challenges and risks for the supplier. The RM is argued to be a central part of the BM, which describes the rationale of how the company creates, captures and delivers value (Osterwalder and Pigneur, 2010; Gassmann et al., 2013). The business model consists of several components (Teece 2010; Amit and Zott, 2011), and Zhang and Banerji (2017) identify the impact on the different components of the BM as a major challenge and barrier for the future dispersion and usage of IRMs among manufacturing companies.

Ng. et al. (2013) and Gebauer et al. (2017b) state that despite the potential benefits from offering an IRM, companies often fail when trying to integrate them into their current organization due to insufficient understanding of how the BM becomes affected. The main complexities relate to lack of transforming the BM in an accurate way to cope with the adjustment the implementation of an IRM requires (Bonnemeier et al., 2010; Reim et al., 2015; Gebauer, et al., 2017a; Zhang and Banerji, 2017). The challenges of transformation from TRMs to IRMs seem to be underestimated and hard to predict (Roegner et al., 2001; Gebauer et al., 2017a), additionally the challenges for manufacturing companies associated with this transformation are rarely discussed in practice (Sousa-Zomer et al., 2018).

For example, Michelin tried to commercialize a usage-based RM, where the customer would pay per kilometer and in return, Michelin would guarantee and ensure functional tires (Gebauer et al., 2017b). Michelin struggled for years with their offering due to the high complexity of the RM, before they were able to become profitable (ibid). They first became profitable when the separate business Michelin Solutions with its own BM was created, which further highlights the inter-

complexity and influence between the RM and the BM (Ulaga et al., 2013). Several companies that have failed with the creation of a profitable IRM exists, among them are famous manufacturing firms as DAF and Mercedes-Benz who explored with these concepts in the 1990s (Ulaga et al., 2013; Gebauer et al., 2017a). However, Mercedes-Benz is currently developing an offering based on a usage-based RM, which they call *pay-how-you-drive*, but it has required over two decades of reflection and development, as well as new technological possibilities to enable this offering (Mercedes-Benz, 2016).

The willingness among suppliers to offer IRMs exists, but due to the complexity of understanding its influence on the different BM components, several of them fail to commercialize their offering and their customer segment becomes very narrowed (Gassmann et al., 2013; Reim et al., 2015; Gebauer et al., 2017a). For example, Atlas Copco's subsidiary Epiroc claims to offer a *pay-per-use* solution, but currently not on a global scale and more in terms of specific projects and key accounts (Epiroc, 2016). Additionally, the *pay-per-kilometer* offering by Michelin is only available for trucks and not for other types of vehicles (Michelin, 2017).

IRMs affect the current business and the BM in ways many facilitators are unable to recognize, which makes the long-term success of Rolls-Royce hard to understand for many organizations (Ulaga et al., 2013; Gebauer et al., 2017a). The problem of understanding how a phenomenon affects the overall among organizations can be illustrated in the automotive industries, where several automotive companies struggled to apply the concept Toyota Production System, which seemed simple but was severe to truly understand and decode (Towill, 2007).

The literature seems to be in consensus regarding that IRMs are likely to provide new challenges for organizations, but the implementation and influence on the BM is an understudied area which needs to be further analyzed to provide relevant guidelines for transforming companies (Bonnemeier et al., 2010; Reim et al., 2015; Gebauer et al., 2017a; Visnjic et al., 2017; Zhang and Banerji, 2017).

1.3 PURPOSE OF THE STUDY

As illustrated by the problem discussion, there is a need for further research of how IRMs should be implemented which requires an understanding of how the components of the BM will become influenced, since companies often fail in using them (Gebauer et al., 2017a). The purpose of this master thesis is therefore to investigate how IRMs influence the different components of a BM, to better prepare transforming companies and lower the risk of failure.

The study will review existing academic literature within the area and perform multiple case studies of companies that have implemented an IRM or are aiming to, in order to acquire practical knowledge crucial to explain the phenomena. Findings from the literature review will be compared with the empirical data collection to generate an analysis and provide a framework of how to implement an IRM. To better guide organizations, the business model canvas (BMC) (Osterwalder and Pigneur, 2010) will be used as a base for this thesis since it is suggested as a well-known BM framework within the industry.

1.4 RESEARCH QUESTION

The research question for this thesis has been formulated based on an identified knowledge gap in previous research and the fact that companies have failed to implement innovative revenue models due to problems related to their business model (Ulaga et al, 2013, Gebauer et al, 2017a).

How are the Business Model components of large global manufacturing firms influenced when implementing an Innovative Revenue Model?

1.5 CONTRIBUTIONS

The current literature emphasizes only on the description of the different IRMs and lacks the specific influences IRMs have on the BM. This study contributes with a first attempt to fill this research gap with a comprehensive framework based on the BMC to illustrate potential influences that need to be considered when moving from a TRM to an IRM.

1.6 DELIMITATIONS

The master thesis will investigate IRMs according to the categorization of Bonnemeier et al. (2010) since their research is one of the most famous and cited among the papers relating to this topic. Further requirements of company characteristics have been made to enhance the quality of the study, which are derived from the background of this research. Thereby, only large (more than 1.000 employees and a turnover of more than 5.000.000.000 SEK) global manufacturing firms will be considered, which facilitate a more accurate conclusion for similar cases compared to if no delimitation would have been made. No industry specific delimitation has been made since no previous knowledge exists that would enable an industry categorization, and the manufacturing firms that currently offer IRMs operate in diverse industries. However, the study can be considered as most relevant for firms manufacturing engines, vehicles and/or machinery, since the case companies operate within those industries. Additionally, companies that have not implemented any type of IRM have been used as case companies to enable a broader discussion in the analysis to compare believed influence with experienced influence. By adding the three companies that do not currently offer IRMs, the amount of data per company type increases, to mitigate the limitation of the low amount of manufacturing companies that currently offer IRMs.

The researchers have chosen to separate the BM into different BM components even if the components are interrelated. The choice of viewing the BM components in isolation is argued to be necessary in order to provide a structure that facilitate an understanding of why something is influenced and how. The researchers further assume the different IRMs to have a similar influence on the BM components, which might be a simplification of reality, but necessary to make since both the literature and real companies use different IRMs synonymously in several cases. Additionally, the choice of basing the research on the BMC may affect the outcome of the study, but is motivated by its familiarity among researchers and practitioners to ensure an extensive understanding of the influence on the BM. Lastly, the researchers' choice of interviewing one person from each of the

chosen departments (*Business Development, Sales, Finance and Aftermarket*) may not be representable to provide a holistic view for a company perspective. However, the researchers argue that these four departments are crucial for understanding the influence of the IRMs and can thereby be suggested to provide a high quality based on the limitation of only conducting a few interviews per case company.

1.7 DISPOSITION

The thesis is divided into six chapters and is structured in the following way:

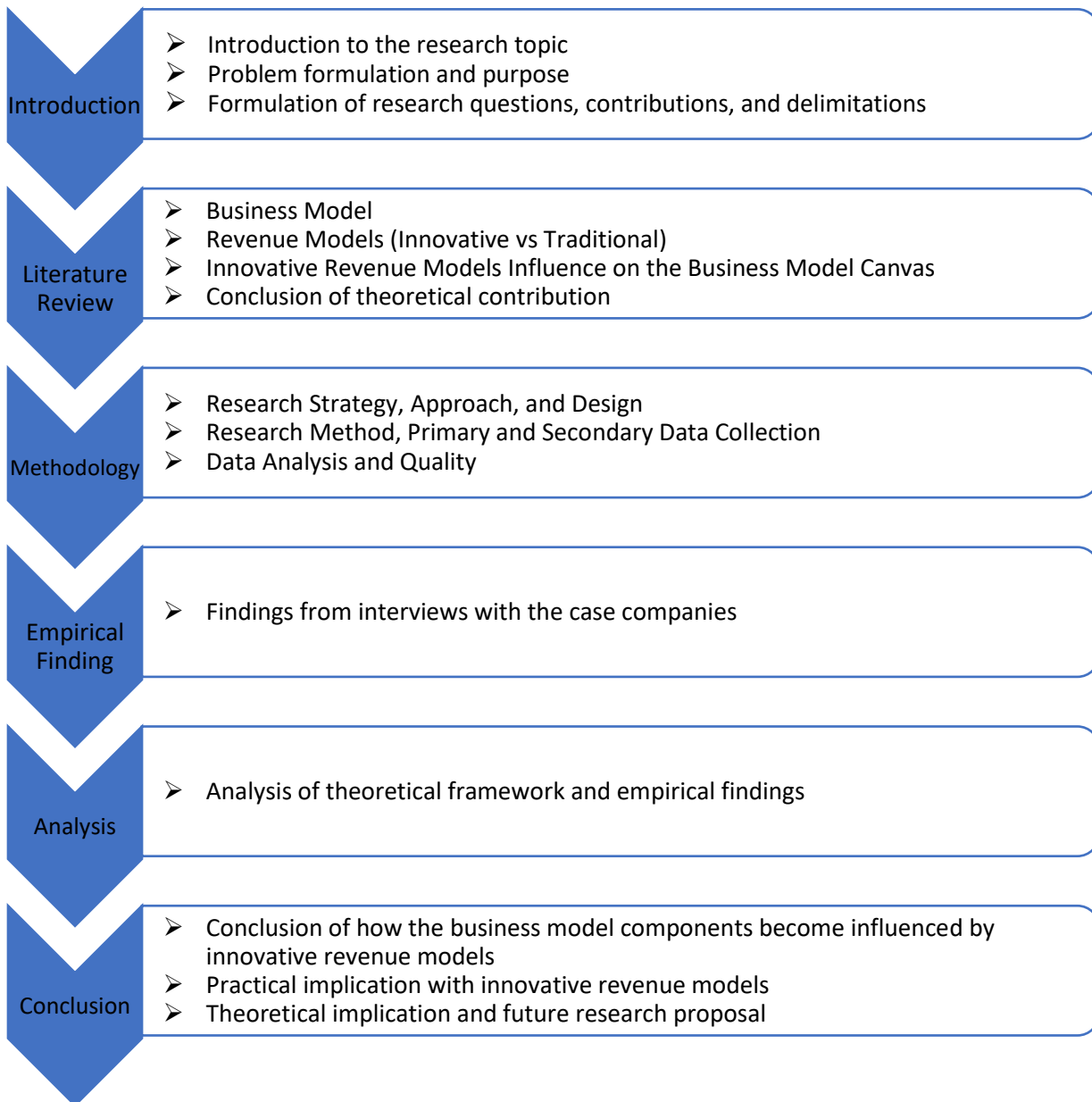


Figure 1.1. Disposition

2. THEORETICAL FRAMEWORK

This chapter will present a review of existing literature on the topic and create a framework to use throughout the thesis as structural guidance. Initially, the Business Model concept is explained followed by an illustration of different Business Model frameworks and their components to provide an understanding of the interdependencies within a Business Model. Secondly, the concept Revenue Models is presented and different types of Revenue Models are discussed. Lastly, there is a focus on Innovative Revenue Models and their influence on the components of the Business Model, which are presented according to the Business Model Canvas.

2.1 BUSINESS MODEL

2.1.1 BUSINESS MODEL CONCEPTUALIZATION

The concept of a Business Model (BM) can be traced sixty years back in time, and since then a scientific discussion has been carried through, to better explain what a BM is and how companies can use it (Fallahi, 2017). However, no widely accepted definition of a BM exists among scholars (Morris et al., 2005; Teece, 2010), and different definitions of BMs have been used in previous studies (Chesbrough and Rosenbloom, 2002; Osterwalder et al., 2005; Johnson et al., 2008; Teece, 2010; Amit and Zott, 2011). The lack of consensus among scholars have resulted in that BMs have been conceptualized after different characteristics, e.g. an architecture (Timmers, 1998; Teece, 2010), a framework or model (Afuah, 2004), method (Afuah and Tucci, 2001), a model (Chesbrough & Rosenbloom, 2002; Osterwalder et al., 2005; Johnson et al., 2008; Kaplan, 2012), and a logic (Casadesus-Masanell and Ricart, 2010). Saebi and Foss (2015) argues that this variation has created an ambiguity among what a BM really is and what it includes, which has resulted in an emergence of economic, operational and strategic perspectives to explain how companies deliver value (Chesbrough, 2007; Johnson et al., 2008; Teece, 2010).

A common way to explain the BM has been by structuring it around different components or elements (Ritter and Lettl, 2018), which is used by several scholars including Chesbrough and Rosenbloom (2002), Johnson et al. (2008), and Kaplan (2012). A well-used way to conceptualize the structuring is through the Business Model Canvas (BMC) created by Osterwalder and Pigneur (Teece, 2010; Amit and Zott, 2011; Fallahi, 2017). The BMC is constituted by nine interrelated components; *value proposition, customer segments, customer relationships, distribution channels, key resources, key activities, key partnerships, cost structure and revenue structure*, and is based on Osterwalder's previous research from 2005, where he defines the BM as: “*A conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. It’s a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams.*” (p.17)

In Table 2.1 several different BM definitions and components originated from diverse academic scholars are illustrated as a proof of the wide heterogeneity within the literature. Amit and Zott (2011) and Foss and Saebi (2015) argue that the disagreement concerning the BM definition and the diverse component structure illustrate the complexity of understanding the BM from a single perspective. The complexity is further enhanced by the net of linkages and interactions among the different components (Osterwalder, 2005; Foss and Saebi, 2015).

Authors	BM Definition	BM Components
Margretta (2002)	“Business models are, at heart, stories – stories that explain how enterprises work [...] The business model tells a logical story explaining who your customers are, what they value, and how you will make money in providing them that value.” (p. 4)	Value to customer Customer definition Revenue logic Economic logic
Andr�n et al. (2003)	“What, in practice, is usually referred to as a ‘business model’, composed of three key components: a description of what the company offers to its customers (an offering consisting of products and/or services), who these customers are (market and customer segments), what value is created and how this value is shared between all involved actors (revenue model).” (p. 551)	An offering consisting of products and/or services, Market and customer segments Revenue model
Chesbrough (2007)	“At its heart, a business model performs two important functions: value creation and value capture. First, it defines a series of activities, from procuring raw materials to satisfying the final consumer, which will yield a new product or service in such a way that there is net value created throughout the various activities [...]. Second, a business model captures value from a portion of those activities for the firm developing and operating it.” (p. 12)	Value Proposition Market segment & Revenue Generation Value Chain Cost Structure & Profit potential Value network Competitive Strategy
Johnson et al. (2008)	“A business model consists of four interlocking elements that taken together create and deliver value.” (p. 52)	Customer value proposition Profit Formula Key resources Key Processes
Osterwalder and Pigneur (2010)	“A business model describes the rationale of how an organization creates, delivers and capture value.” (p.14)	Value proposition Customer segments Distribution channel Customer relationships Key resources Key activities Key partnerships Revenue streams Cost structure
Teece (2010)	“A business model articulates the logic and provides data and other evidence that demonstrates how a business creates and delivers value to customers. It also outlines the architecture of revenues, costs, and profits associated with the business enterprise delivering that value.” (p. 173)	Technologies Customer benefits Target markets Revenue streams Ways of capturing value

Schaltegger et al., (2011)	“Elusive idea of how business is conducted in order to create and capture economic value.” (p. 12)	Value Proposition Infrastructure Customer Financial Aspect
Zott and Amit (2012)	“A system of interconnected and interdependent activities that determines the way the company “does business” with its customers, partners and vendors” (p. 42)	Content Structure Governance
Gassman et al. (2012)	“Business models describe how the magic of a business works based on its individual bits and pieces.” (p. 1)	Value Proposition Value Chain Revenue Model
Kaplan (2012)	“A business model is a story about how an organization creates, delivers and captures value.” (p. 3)	Value Creation Value Delivery Value Capture
Saebi et al. (2017)	“Although there is no generally agreed upon definition, many contributions to the literature define it in terms of the firm’s value proposition and market segments, the structure of the value chain required for realizing the value proposition, the mechanisms of value capture that the firm deploys, and how these elements are linked together in an architecture.” (p. 567)	Structure of the value chain Value proposition and market segments Mechanism of value capture Firm-specific architecture in which the elements are linked

Table 2.1. Business Model definitions and component structure of chosen literature.

The characteristics and the number of components differs both over time and among scholars (Fallahi, 2017), and central components can be found in the literature which can be seen as more common than others as e.g. *Value Proposition*, *Revenue Model* and *Infrastructure* (Gassmann et al., 2013; Foss and Saebi, 2015; Saebi et al., 2017). To provide a holistic picture of the interrelatedness among diverse components within the BM, different elements can be used (Osterwalder and Pigneur, 2010; Saebi et al., 2017). Schaltegger et al. (2011) argue that the components are vital for the management of the BM, hence there is a need for understanding before adjusting a component. Other scholars argue that an important aspect of the BM is to holistically understand how it creates and captures value through the activities related with the value proposition, which is why the value proposition is argued to form a central role (Osterwalder, 2004; Osterwalder and Pigneur, 2010; Sommer, 2012; Gassmann et al., 2013; Saebi et al., 2017). Furthermore, there are scholars that argue the customers to be specifically important within the value proposition (Margretta, 2002; Johnson et al., 2008), whereas others considered the customers to belong to another element (Kaplan, 2012; Gassmann et al., 2013). The value proposition concerns *what value is created*, whereas the customer perspective, their relationship and process of value delivery can be categorized into *how value is transferred* (Margretta, 2002; Osterwalder, 2004; Johnson et al., 2008; Kaplan, 2012; Gassmann et al., 2013).

How value is created is an element often mentioned by the literature in some way, which refers to the relationship with the stakeholders in form of partnership and necessary activities and resources to ensure the value creation (Chesbrough, 2007; Osterwalder and Pigneur, 2010; Schaltegger et al., 2011; Gassman et al., 2012; Saebi et al., 2017). The financial perspective is commonly a separate element among scholars, which refer to the mechanism of *how revenue is captured* (Andrén et al.,

2003; Chesbrough, 2007; Johnson et al., 2008; Kaplan, 2012; Osterwalder and Pigneur, 2010; Teece, 2010; Gassmann et al., 2013). However, it is vital to underline that there are interconnections to the other elements since adjusting the financial aspects, for example the revenue model, is likely to require adjustment for the other elements depending on the novelty (Afuah, 2004; Schaltegger et al., 2011; Sommer, 2012).

The BMC visualizes the interrelations among the components of the BM in an understandable way by being grouped according to the four different elements as shown in table 2.2. However, there are some skepticism among scholars regarding that the BMC lacks the aspects of the environment, wider society and that it to some extent neglect the time aspects, hence it becomes static (Schief and Van Putten, 2012; Wells, 2013). Using the BMC enable a visualization of the existing or wanted BM in a way where the knowledge easily can be shared (Zott et al., 2011). The BMC can be used to understand potential challenges of benefits of entering unknown business areas or adjusting some of the building blocks or entire elements (ibid).

Elements	Description of Elements	Allocation of components
What value is created	What value the service / product creates for the user.	<ul style="list-style-type: none"> • Value Proposition
How value is created	Required processes, activities and knowledge internally as well as externally to enable delivery of the value.	<ul style="list-style-type: none"> • Key Activities • Key Resources • Key Partners
How value is transferred	Encompass the transferred value’s connection and relationship with the intended target group as well as the organizations role throughout the value chain to capture synergies and mitigate risks.	<ul style="list-style-type: none"> • Customer Segments • Customer Relationships • Distribution Channels
How revenue is captured	Explains the profit model based on the organizations revenue model. The costs structure is suggested to be involved in the aspect of revenue generation.	<ul style="list-style-type: none"> • Revenue Streams • Cost structure

Table 2.2. Element allocation of the BM components suggested by Osterwalder & Pigneur (2010).

For the use of this thesis, the BM definition made by Osterwalder and Pigneur (2010, p. 14) will be used, “A business model describes the rationale of how an organization creates, delivers, and capture value”, and the research will use the BMC as a tool for answering the research question. Barquet et al. (2011) and Meier (2013) suggest the BMC as an appropriate tool to use when modifying parts of the BM since it visualizes a holistic view in a favorable way for examining interrelations. Additionally, Teece (2010) and Steinhöfel (2016) suggest the BMC to be a validated tool since it is based on the input from Osterwalder et al. (2005) and fourteen famous BM ontologies including Chesbrough and Rosenbloom (2008) and Zott et al. (2011), as well as it has been used by several large corporations including; IBM, Ericsson, and Deloitte. For an efficient use of the BMC, the interrelationship among the components is necessary to understand, which is why an explanation of each component is required (Osterwalder and Pigneur, 2010). Explanation of each component together with its influence when implementing an IRM is discussed according to the academic papers in section 2.3.

2.2 REVENUE MODEL

2.2.1 REVENUE MODEL CONCEPTUALIZATION AND RELATION TO BUSINESS MODEL

The definition of a revenue model (RM) is ambiguous within the literature and it is sometimes used as a synonym with the business model (BM) since some practitioners consider these two terms to affect the business in a similar way (Andr n et al., 2003; Afuah, 2004; Johnson et al., 2008). The RM can be defined as a way to describe the structure of how the organization generate profit, and each customer segment can contain multiple revenue streams (Afuah, 2004; Gassmann et al., 2013), compared to the BM which describes holistically the structure and its interdependencies of how an organization generates value for its customer (Amit and Zott, 2001; Osterwalder and Pigneur, 2010). Additionally, the organization is able to have several BMs at the same time (ibid). The difference between the two terms can thereby be concluded to that the BM describes *how a company creates value, delivers and captures value* whereas the RM describes *how a company generates revenue from that value it has created for customers* (Afuah, 2004; Bonnemeier et al., 2010; Gassmann et al., 2013). Zott et al. (2011) view the RM as a way to describe revenue sources, their volume, and distribution, compared to Dasilva and Trkman (2014) who simply consider it as a mean by which value is captured. Amit and Zott (2001) see the BM and RM as complementary but distinct concepts since the latter is mostly concerned with value appropriation compared to the former, which refers to the value creation itself. They further argue that the ways an organization creates and appropriates value are highly related and hence correspondingly important since the value is established by the way in which transactions are enabled. Osterwalder and Pigneur (2010) and Zott et al. (2011) emphasize the relationship between RMs and pricing, where pricing has been more explored among researchers (e.g. Hinterhuber, 2004; Bonnemeier et al., 2010). However, Zott et al. (2011) still consider the RM to include more than a pricing strategy, e.g. how the revenue is distributed.

The RM can be considered as a crucial component of the BM (Afuah, 2004; Zott et al., 2011), which is illustrated in the BM frameworks provided by e.g. Andr n et al. (2003) and Gassman et al. (2013), which both consist of three BM components where the RM is one. In other BM frameworks the characteristics of the RM is diverse and ambiguous and can be comprised by combinations of components, which Osterwalder and Pigneur (2010) try to emphasize with the focus on interrelations among the different components in their BMC, where the RM tend to be most related to the value proposition, revenue streams, and cost structure. They suggest that the cost structure is likely to vary when capturing revenues in a novel way, whereas Yunus et al. (2010) argue that the RM should be separated from the cost structure as it focuses more on the revenue capturing. However, Afuah (2004) and Zott et al. (2011) highlight the interdependence between the RM and the value proposition, and Osterwalder (2004), and Schaltegger et al. (2011) argue that changes in RM are likely to affect the other components to some degree. For the use of this thesis, the RM will be defined as *how the company generates revenue from the value it has created for the customers* and it will be considered as a central part of the BM (Afuah, 2004; Bonnemeier et al., 2010; Zott et al., 2011; Gassmann et al., 2013; Trkman, 2014)

2.2.2 TRADITIONAL VS INNOVATIVE REVENUE MODELS

Different types of RMs exist (Afuah, 2004; Gassman et al., 2013; Reim et al., 2015) and some researchers have tried to make them more tangible e.g. Bonnemeier et al., (2010) by identifying seven commonly used RMs, categorize them and distinct them into traditional revenue models (TRM) and innovative revenue models (IRM), see figure 2.1. The categorization made by Bonnemeier et al. (2010) is based on the difference within the value proposition, performance of the offering, the price and cost parameter. The value proposition for the customer differs among TRMs and IRMs, where for the former the offering is based on conventional products and services compared to the IRM which emphasizes the actual input or output for the customer (ibid). Organizations can use different RMs distinctively, but commonly is a mixture used to maximize profitability and ensure sustainable revenue streams (Zott et al., 2011; Reim et al., 2015).

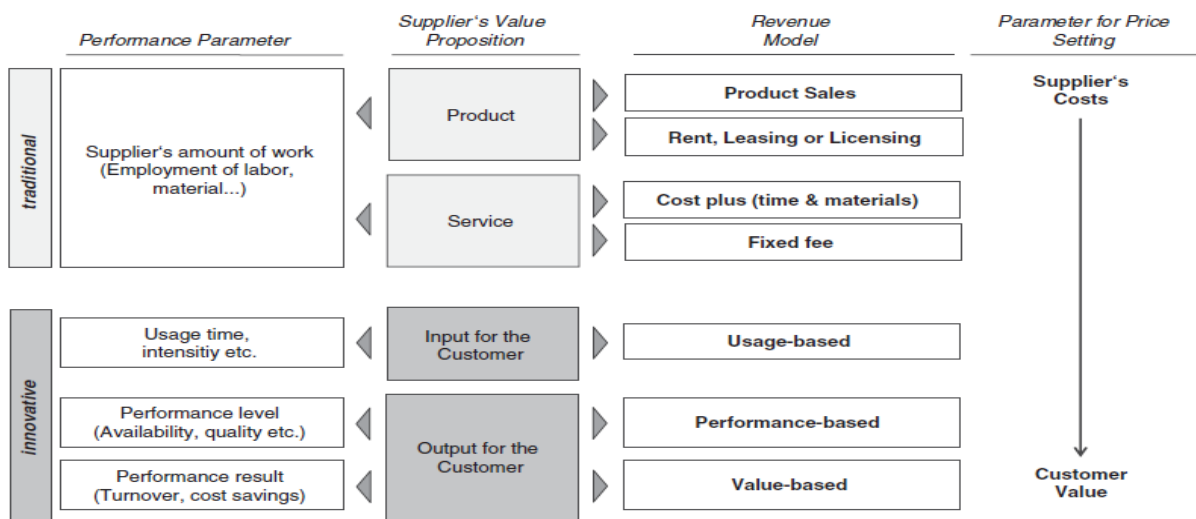


Figure 2.1. Traditional versus innovative revenue models (Bonnemeier et al., 2010, p. 230).

The performance parameters are measured in the supplier's effort to provide the offering compared to the price setting parameter that is reflected in the supplier's expenses (Bonnemeier et al., 2010). These parameters vary for the RM depending on the value creation for the customer, where the IRM is suggested to provide more value to the customer. Bonnemeier et al. (2010) argue that the willingness to purchase is reflected in the alignment of customers' and suppliers' objective by matching the pricing parameter with the value created for the customer. The complexity of the revenue models increases with the customer value, and the *Product sales* RM can be seen as a basic transactional variant where the ownership right is transferred. In the case where only the possession right is transferred to the customer, the RM is referred to as *Rent, Leasing or Licensing*. The value proposition of the last two TRMs is based on service offering, where the *Cost plus* model ensure profitability by adding a sum to the amount of work, compared to setting a price that does not vary with the actual service utilization for the *Fixed fee* model. (Bonnemeier et al., 2010)

Bonnemeier et al. (2010) argue that competition, customer willingness to purchase, and costs are central to the choice of TRM in the view of the supplier. For an IRM the cost aspect is not as

crucial, since the supplier focus more on the provided customer value, hence the value proposition is influenced by the specific value the IRM provides for the customer. The value proposition of the *Usage-based* RM is grounded on the input to the production process of the customer, and a pre-negotiated price that varies with the utilization of the service constitutes the payment (Bonnemeier et al., 2010). The value proposition for the two remaining IRMs is based on the output from the perspective of the customer. In the *Performance-based* RM, the price is pre-negotiated and based on a performance level guaranteed by the supplier, and penalties will apply to the supplier if failing to deliver the promised performance (ibid).

In the academic literature, a performance-based RM can likewise be known as an outcome-based RM (Hypko et al., 2010) or performance contract (Ng et al., 2013). Böhm et al. (2016) describe two outcome-based RMs, one where payment is based on availability and one where payment is based on economic results of the customer and the two RMs are related to specific risks and benefits. The *Value-based* RM focus on optimization of the internal processes of the customer and the pricing is mainly based on cost-saving or increased revenue generation but can be influenced by customer satisfaction (Bonnemeier et al., 2010). Töytäri et al. (2015) suggest the price sensitivity to be closely related to the benefits perceived by the customers, hence will be within the range of customer perceived net benefits and the supplier costs.

Reim et al. (2015) highlight two different IRMs as presented in figure 2.2, which consists of *Use-oriented* and *Result-oriented*, whereas the latter can be compared to the performance-based RM presented by Bonnemeier et al. (2010). Reim et al. (2015) use the business components from Kaplan (2012), see Figure 2.2., to illustrate how the BM is influenced by different RMs. Reim et al. (2015) and Bonnemeier et al. (2010) see the result or performance oriented RMs as more complex in their nature compared to the use-oriented, since they fulfill the value creation, delivery, and capturing in different ways. However, considering only the IRMs and TRMs separately, there are similarities and linkages that further explain the categorization made by Bonnemeier et al. (2010). Bonnemeier et al. (2010) further suggest that IRMs are more deeply engaged in maximizing the value proposition from a customer perspective compared to TRMs, which also is illustrated in the research presented by Reim et al. (2015).

RM Type	TRM	IRM	IRM
	<i>Product-oriented</i>	<i>Use-oriented</i>	<i>Result-oriented</i>
<i>Value creation</i>	Provider takes responsibility for the contracted services.	Provider is responsible for the usability of the product.	Provider is responsible for delivering results.
<i>Value delivery</i>	Provider sells and services the product sale and service (e.g., maintenance or recycling).	Provider assures the usability of the physical product along with service.	Provider actually delivers result.
<i>Value capturing</i>	Customer pays for physical product and for the performed services.	Customer payments are based on the usage.	Customer payments are based on outcome units, they pay for the result.

Table 2.2. Comparison of business model types (Adopted from Reim et al., 2015, p. 66).

Different IRMs are discussed among several researchers (e.g. Bonnemeier et al., 2010; Kleeman and Essig, 2013; Ng et al., 2013; Reim et al., 2015; Töytäri et al., 2015; Böhm et al., 2016; Gebauer et al., 2017a), however some of these (e.g. Reim et al., 2015) refer the usage-based RM as a use-oriented BM, which can be explained by the ambiguity in the conceptualization of RMs and that it is considered as a key components of the BM (Zott et al., 2011; Dasilva and Trkman, 2014). For the use of this research, the definition of IRMs will follow the research from Bonnemeier et al. (2010) and use the input from other scholars (e.g. Reim et al., 2015; Gebauer et al., 2017a).

The usage of IRMs has increased lately due to the technological development that simplifies the management of the complexities and the risks the IRMs create (Bonnemeier et al., 2010; Gebauer et al., 2017a; Visnjic et al., 2017). Examples of global manufacturing firms that use some kind of IRM are; Rolls-Royce, Michelin, BAE Systems, Caterpillar, Bombardier, and Hitachi (Ng. et al., 2013; Gebauer et al., 2017a; Visnjic et al., 2017). However, the distinction between the different IRMs can sometimes be considered as vague (Bonnemeier et al., 2010; Töytäri et al., 2015; Böhm et al., 2016). This can be illustrated by the categorization of the *power-by-the-hour* concept presented by Rolls-Royce, where the customer is charged depending on running hours, which according to Gebauer et al. (2017a) is a usage-based RM, whereas Ng et al. (2013) consider this as an outcome-based/performance-based RM. Even though technological development simplifies management of the additional risks IRMs create, there is a necessity to deeper examine its affection on a BM component level to gain holistic knowledge about how the BM is influenced (Schaltegger et al., 2011; Gebauer et al., 2017a; Visnjic et al., 2017).

2.3 INNOVATIVE REVENUE MODELS INFLUENCE ON THE BM COMPONENTS

Adjustment of RM is likely to affect the organizational structure of how companies operate and do business (Bonnemeier et al., 2010; Gassman et al., 2013). Ng et al. (2013) suggest that changes in the RM empower a change in the BM. Andrén et al. (2003), Johnson et al. (2008), and Bonnemeier et al. (2010) highlight that the novelty of the new RM is likely to influence how the different components of the BM become affected. Although there are differences between the IRMs they necessitate similar changes to the BM components in general (Bonnemeier et al., 2010; Reim et al., 2015; Töytäri and Rajala, 2015; Gebauer et al., 2017a), which is why a generic approach to the discussion about IRMs will continue. However, the degree of challenges and influences on the different BM components when transitioning to an IRM is likely to differ depending on the complexity and novelty of the offered solution (Bonnemeier et al., 2010; Böhm et al., 2016). For example, Rolls-Royce's pay-per-use service is more complicated than the pay-per-kilometer offering by Michelin, since the pay-per-use concept guarantee uptime (ensuring that their engine shall work a specific amount of the time, e.g. 99.5 %) for a complex engine where they need to predict service and repair needs, and fix those during specific time slots when the customer is not using the products (Gebauer et al., 2017a).

Implementation of IRMs is likely to induce a change from transaction-based to long-term relationship-based connection with stakeholders and specific customers (Bonnemeier et al., 2010;

Visnjic et al., 2017). This transition may require redesigning existing contractual and relational connections to facilitate a reallocation of the risks and revenue structure (ibid). Thereby, there is a necessity to recognize a new supporting BM to deal with the organizational changes and strategies the transition is likely to require (Gebauer et al., 2017a; Visnjic et al., 2017). Thus, identification of how the underlying BM components are influenced is necessary to establish a holistic picture of how the BM becomes affected, which is vital to ensure a business transformation with lower risk (Hypko et al., 2010; Töytäri et al., 2015; Böhm et al., 2016).

To gain a better understanding and to structure the discussion about how IRMs influence the BM components, the composition and content of table 2.2 will be used. Thus, the BMC (Osterwalder and Pigneur, 2010) nine components (*Value Proposition, Key Resources, Key Activities, Key Partners, Customer Segments, Customer Relationships, Distribution Channels, Revenue Streams, Cost Structure*) will be presented and discussed with input from other scholars. Additionally, a discussion will follow on how the usage of IRMs will affect the different components based on the existing literature.

2.3.1 VALUE PROPOSITION

The value proposition describes what value an organization is creating, solving or satisfying for a specific customer (Zott and Amit, 2010). Osterwalder and Pigneur (2010, p.22) define the value proposition as “*an aggregation or bundle, of benefit that a company offers its customers*”, and it can further be viewed as the believed form of how the benefits provided to the customer is delivered, acquired and experienced (Teece, 2010). The values can be quantitative (e.g. speed of service, price) or qualitative (e.g. customer experience, design) and are based on the capabilities of the organization and/or partners, to ensure delivery to the targeted customer segment(s) (Osterwalder, 2004; Chesbrough, 2007). The benefits a company provides to its customers can be branched into several attributes, where reasoning can be perceived as vital since it represents the expected level of usefulness for the customer (Sommer, 2012).

Osterwalder (2004) split reasoning into; effort, risk, and use, where use is considered as the core value and is generated by using the provided service/product. Additional value is created by lowering the required level of effort for the provided service through e.g. reducing the search, evaluation and acquisition costs as well as reducing the need of maintenance, operations, and training costs (ibid). Moreover, by mitigating financial, performance and other risks the value increases for the customer since a higher level of utilization and efficiency can be achieved without jeopardizing the operational activities (Sommer, 2012). The life cycle including acquisition, use, renewal and value transfer of the provided service/product is another attribute of the value proposition, which is affected by the price and the level of value (Osterwalder, 2004).

By implementing an IRM, which is based on usage, performance or value, the customer is provided with a solution instead of only a product (Gebauer et al., 2017b; Visnjic et al., 2017). The value is not only the product itself, it is more in how well the offering fits with the BM of the customer, and

the customer no longer buys a product or service, instead he pays for the input or output (Bonnemeier et al., 2010; Töytäri and Rajala, 2015). The supplier often guarantees a specific uptime and/or performance delivery to secure the customer value, hence the customer is able to focus more on their core activities due to mitigation of risk factors (Ng et al., 2013; Gebauer et al., 2017a; Visnjic et al., 2017). This shift is further addressed by Bonnemeier et al. (2010), who argues that the value proposition can either be *1. Product Focus 2. Service Focus 3. Input Focus 4. Output Focus*, which depends on the offering and the type of RM the organizations BM currently offers. Several manufacturing firms generate revenue through downtime of their products, which is no longer applicable with an IRM and thereby adjustment of the BM structure to facilitate support is likely to be required (Gebauer et al., 2017a; Visnjic et al., 2017). The business incentives of the supplier are thereby becoming more aligned with the customer since there are no benefits of downtime (Gebauer et al., 2017a).

2.3.2 KEY ACTIVITIES

The most important things an organization does to ensure successful operations are referred as key activities, which enable the value proposition to generate cash flow, reach markets, and to maintain customer relationships (Osterwalder and Pigneur, 2010). The key activities are likely to differ depending on BM (ibid). Osterwalder (2004) states that key activities focus on *problem-solving* to generate new solutions for the value proposition, *production* of the product/service, and ensuring appropriate *network/platform* design. The key activities and resources have an interrelationship, since the resources are shared among the activities (Osterwalder, 2004; Johnson et al., 2008), and the ability to generate combinations of these are referred to as dynamic capabilities (Teece, 2010). As the value proposition focus more on the input or output for the customer with IRMs compared to TRMs (Bonnemeier et al., 2010), the focus on *problem-solving* is likely to increase in its importance (Osterwalder and Pigneur, 2010; Ng et al., 2013; Gebauer et al., 2017a).

The complexity of IRMs creates requirements of closer collaboration with stakeholders to mitigate risks and/or ensuring certain capabilities, hence trust and relationship creation become additionally essential for IRMs (Anderson et al., 2006; Reim et al., 2015; Böhm et al., 2016). Tuli et al. (2007) argue that the way companies interact with customers need to change into a relational process since the interdependence among the customer and supplier increases due to the complexity in ensuring IRMs. Bonnemeier et al. (2010) and Töytäri and Rajala (2015) argue that customer understanding and analysis of data becomes more vital for IRMs since there is a need to predict and follow up the provided services to mitigate the higher risk included.

Contract management is central to define the responsibilities and liabilities of the supplier, customer and other potential partners (Reim et al., 2015). The contracts need to be established with the right terms (*i.e. guaranteed uptime, allowable downtime, price, performance*) and managed so that required activities can be performed (ibid). Bonnemeier et al. (2010) and Gebauer et al. (2017a) highlight the increased risks and suggest that this need to be incorporated into the price of the service offering as the responsibility of uptime and often ownership stays with the supplier, instead

of being transferred to the customer. They further highlight the complexity of estimating the costs over a contract period, which need to be incorporated in the pricing (ibid). Additional to pricing, there need to be an emphasis on legal aspects of the contracts due to ownership issues and the complexity of IRMs (Sawhney, 2006; Reim et al., 2015).

Since most of the risks stays with the supplier, Reim et al. (2015) and Gebauer et al. (2017a) underline the need of appropriate methods of monitoring the use and outcome of the offering. Prediction of when the customer uses the product or when the promised performance is delivered becomes central to build up the right financial structure of the contract (Gebauer et al., 2017a). Several organizations thereby need to work with financial activities to enable the value proposition and to finance the offering (ibid). Töytäri and Rajala (2015) emphasize the need of aligning the value proposition between the vendor and customer, as well as open communication to create transparency regarding data exchange to ensure the right monitoring to enable contract management. Reim et al. (2015) further suggest that the design of the product should be simplified or modular, hence easy to service in order to ensure reliability and profitability, which is why the incentives for the supplier of developing sustainable solutions increase.

2.3.3 KEY RESOURCES

The key resources define the most vital assets that facilitate the organization to generate an attractive value proposition for its customer segment in order to gain revenue (Osterwalder and Pigneur, 2010). The distinction of key resources varies with the BM and can be categorized as *financial*, *human*, *intellectual* or *physical*, which can be leased or owned by the company, alternatively obtained from key partners (Osterwalder, 2004). The resources within an organization form the capabilities that allow for the creation and offering of a competitive value proposition, hence they need to support the required activities (Osterwalder and Pigneur, 2010). Since the value proposition becomes affected when implementing an IRM (Gebauer et al., 2017a), there might be a need for new resources depending on the novelty of the BM (Osterwalder and Pigneur, 2010; Gassmann et al., 2013). Resources as knowledge about customers, costs, funding of the RM, and IT systems are likely to be required (Ng et al., 2013; Reim et al., 2015; Gebauer et al., 2017a). The funding aspect becomes crucial for manufacturers that lack financial strength since their cash flow will become negatively affected by the IRM (Gebauer et al., 2017a). Reim et al. (2015) further highlight the need for legal knowledge to ensure appropriate terms within these complex contracts that IRMs create.

2.3.4 KEY PARTNERS

A partnership is an agreement formed among two or more independent actors to perform an activity by jointly coordinating necessary capabilities, resources and activities (Dussauge and Garrette, 1999; Sommer, 2012). The network of key partners outlines which part of the activity configuration and which resources distributed among external organizations that are vital to gain access to external resources, capabilities, and activities (Osterwalder, 2004). Key partners and alliances have

had an increasing importance of the strategy implementation as well as of the BM in general (ibid). They further help organizations to recognize dysfunctional activities and minimize the strategic blind spots (Sommer, 2012). Zott et al. (2011) argue that an organization needs to understand the value collaboration can generate among stakeholders (internal and external). Osterwalder and Pigneur (2010) suggest three incentives for an organization to establish partnerships; 1. *Optimization and economies of scale*: to reduce costs and to optimize, 2. *Risk and uncertainty reduction*: common when for example launching new technologies to market, 3. *Acquisition of specific resources, capabilities, and activities*: to ensure knowledge or licenses hard to capture or generate.

Central to all IRMs are the complexity which increases the dependency on external actors to support the IRM, since several activities become more crucial than before due to penalties for not delivering promised uptime, performance or value (Reim et al., 2015; Visnjic et al., 2017). Gebauer et al. (2017a) argue that relationships with suppliers and stakeholders increase since failure in value proposition delivery creates a larger negative impact with an IRM. They further suggest that partnerships with banks and other financial partners are required for some firms that are unable to fund their RM internally, and Gebauer et al. (2017b) add partnership with insurance companies to mitigate the risk of owning the asset. Additionally, there may be a need of collaborating with legal advisory firms to acquire the complex legal knowledge required to ensure that the legal implications in terms of responsibility and specification of the contracts are maintained (Reim et al., 2015).

2.3.5 CUSTOMER SEGMENTS

The customer segments define the targeted customer groups the organization aims to reach and serve, which can be summarized as “who the customers are” (Gassmann et al., 2013). Osterwalder and Pigneur (2010) underline the importance of correct customer segmentation where factors as *behaviors, attributes, and needs* of the customer ought to be considered. Furthermore, the customer segments need to reflect the intended market (mass market, niche market, segmented, diversified, multi-side market). The customer segmentation can be based on the type of *channels, relationship, and level of profitability*. The decision of customer segments is vital to ensure a proper BM and since the value created for the customer needs to be established around the customer segments (Osterwalder and Pigneur, 2010). The increased complexity and risk with IRMs tend to make the choice of correct segmentation more crucial (Gebauer et al., 2017a). Töytäri and Rajala (2015) further highlight the need for correct customer segmentation, since value creation can only be maximized when the value proposition is aligned with the goals of the customer.

2.3.6 CUSTOMER RELATIONSHIPS

An organization needs to clarify the type of relationship it wants to have with each of the customer segments, to adapt the activities in order to maximize the value (Osterwalder and Pigneur, 2010). However, relationships can vary over time and an organization is able to have coexisting types of relationships with a customer segment, and they can range from personal to automated (ibid).

Osterwalder and Pigneur (2010) argue that *customer acquisition*, *customer retention*, and *up-selling* drive the motivation for the relationships. Not all customers are equally profitable, which motivates targeted retention approaches by using lock-in and loyalty programs (Sommer, 2012). Moreover, up-selling (sale of add-ons) to existing customers incline a higher profitability than selling to new customers, and customer acquisition is more expensive than retention of existing ones (Osterwalder and Pigneur, 2010; Sommer, 2012). Osterwalder (2004) addresses the importance of brand, trust, and personalization to increase customer commitment.

Collaboration with customers is one of the organizational capabilities that Gebauer et al. (2017a) consider necessary for IRMs, which differ from TRMs where relationships with customers can be based on arm's length transactions. By engaging in a dialogue with the customers, companies' can more accurately predict how the offered equipment will be used and can easier ensure the right value delivery (Ng et al., 2013; Töytäri and Rajala; 2015). The relational process needs to continue throughout the contract to enable an exchange of information and to lower the uncertainty in risk for the supplier (Reim et al., 2015; Gebauer et al., 2017a). A close relationship with the customer facilitates strategic decisions, which will create benefits for both sides of the contract necessary in complex business settings as IRMs create (ibid).

2.3.7 DISTRIBUTION CHANNELS

Distribution channels concern a company's interface with customers through *communication*, *distribution* and *sales channels*, which explain how the organization reaches its customer segments to deliver a value proposition (Osterwalder and Pigneur, 2010). The company is able to reach its customers through different channel types including; fully owned, partner, or a mix of channels, where the degree of interaction, flexibility, and profitability differs (ibid). Delivery can be direct through a sales force or website sales, or indirect through intermediaries or partners (Osterwalder, 2004). The distribution channels are considered to play a vital role in the customers experience, hence there is a need to establish a correct balance among the type of phases and channels (Osterwalder and Pigneur, 2010). This in order to enable a good integration that facilitates a superior customer experience, hence maximizing the value proposition.

The customer experience is more central for IRMs compared to TRMs, which motivate the need of having appropriate channels for transferring the experience and additionally to measure input or output of the value proposition (Ng et al., 2013; Töytäri and Rajala, 2015; Gebauer et al., 2017a). Reim et al. (2015) further highlight the need for appropriate channels to communicate and to distribute the value. Töytäri and Rajala (2015) highlight the need for communication channels with transparency to exchange information crucial for the IRMs.

2.3.8 REVENUE STREAMS

Revenue streams represent the cash a company generates from its activities, and together with the pricing element, this is considered to constitute a set of the revenue model (Osterwalder, 2004).

Companies often have numerous different revenue streams as *lending*, *selling*, and *licensing*, each affected by one or multiple pricing mechanisms (ibid). The pricing mechanism can consist of *fixed pricing* (e.g. pay-per-use, subscriptions), *differential pricing* (e.g. value-based, performance-based), or *market pricing* (e.g. bargaining, dynamic market). The different pricing mechanisms affect the customer behavior differently, where a subscription creates incentives for high usage compared to pay-per-use (Sommer, 2012).

In the case of IRMs, the customers do no longer acquire the product or the service upfront, the value proposition is instead connected to a longer time period and the revenue streams become smaller and recurring instead of upfront (Bonnemeier et al., 2010; Gebauer et al., 2017a). The pricing mechanism becomes focused on customer value instead of the costs of delivery (Bonnemeier et al., 2010). The main difference is found in the time period of when the revenue streams will occur since these are no longer based on fixed terms as in the case of leasing and rental. The revenue streams have to match the usage or when the performance alternatively the value is delivered to the customer (ibid). Since the risk is transferred to the supplier there is an opportunity for increased revenues, but due to new dependencies and activities to manage the risk, there is a probability for increased costs (Bonnemeier et al., 2010; Reim et al., 2015).

2.3.9 COST STRUCTURE

This component contains all the costs the company experience through creating and delivering value to its customers (Osterwalder 2004). Johnson et al. (2008) discuss costs based on the relation to key assets, compared to Osterwalder and Pigneur (2010) who reflect upon variable and fixed costs. The key activities as *production*, *problem-solving*, and *network/platform creation*, as well as the key resources, are argued to be closely related to the cost structure. Furthermore, the cost structure has an interrelation with the value proposition and the revenue streams, since these all related to the financial aspect of the BM (Osterwalder, 2004).

The costs structure is likely to be changed in terms of how the costs are allocated to each activity when implementing an IRM instead of a TRM. Additionally, the costs may increase due to the uncertainty and risk with offering different types of IRMs (Tuli et al., 2007; Reim et al., 2015; Gebauer et al., 2017a). Remote services and IT systems can be used to follow up on the condition of the equipment and to see how the costs develop over time, but these as other required activities are likely to add new types of costs (Gebauer et al., 2017a).

2.4 THEORETICAL CONCLUSION OF INNOVATIVE REVENUE MODELS INFLUENCE ON BM COMPONENTS

By mapping the IRMs influence on the different components in the BMC, the research question becomes answered according to academic papers in the summarized figure below.

Summary of IRMs influence on the BM components according to theory	
<u>What value is delivered</u>	
<i>Value Proposition</i>	<ul style="list-style-type: none"> • Product/Service focus → Input/Output focus • Risk mitigation for the customer • Alignment of incentives
<u>How value is created</u>	
<i>Key Activities</i>	<ul style="list-style-type: none"> • Activities focusing on problem solving • Relational processes in terms of relationship management • Activities to better understand and analyze the customer • Risk mitigation as monitoring, data analytics and predictive maintenance • Activities to create and follow up the contract including legal aspects • Cost estimation and pricing activities increase in importance • Financial activities to fund the IRM offering • Product design activities need to be adapted to support functionality
<i>Key Resources</i>	<ul style="list-style-type: none"> • Appropriate data handling processes & IT systems • Increased need of funding the RM. • Increased requirement of legal knowledge due to a more complex RM and longer interaction with customers. • Stakeholder knowledge becomes more crucial since the business exchange requires continuous delivery • Knowledge about costs over the contract period
<i>Key Partners</i>	<ul style="list-style-type: none"> • Partnerships become more crucial. The key partners depend on the business setting, but new key partners as Financial, Legal and Insurance companies may emerge.
<u>How value is transferred</u>	
<i>Customer Segments</i>	<ul style="list-style-type: none"> • Increased importance in correct segmentation to find appropriate customers for the IRM
<i>Customer Relationships</i>	<ul style="list-style-type: none"> • Increased need of understanding and collaborating with customers
<i>Distribution channels</i>	<ul style="list-style-type: none"> • Increased importance of channels for communication, measurement and logistics
<u>How revenue is captured</u>	
<i>Revenue Streams</i>	<ul style="list-style-type: none"> • No upfront payment • Recurring payments over longer time period • Pricing becomes more complex
<i>Cost Structure</i>	<ul style="list-style-type: none"> • Potentially increased costs for supporting new activities • Increased uncertainty and risk for future costs

Table 2.4. Summary of IRMs influence on the BM components according to theory.

3. METHODOLOGY

In this chapter the choice of research strategy, design and approach in order to investigate the research question are discussed and motivated. The methodology further describes the working process of how the data is collected and analyzed from a qualitative perspective. Lastly, there will be a discussion regarding the quality of the thesis in terms of reliability and validity.

3.1 RESEARCH STRATEGY

To answer the research question in a desirable way a qualitative research strategy was chosen, motivated by the novelty of the topic and limited knowledge within the academic papers. A qualitative strategy enables collection of explanatory valuable information by leveraging people's views and perspectives, which might be hard to acquire through a quantitative strategy since the primary aim is to measure behaviors, opinions, and generalities (Bryman and Bell, 2011; Hussey, 2013). Bryman and Bell (2011) argue that a qualitative research strategy is appropriate when the research aims to investigate "how" something is affected since it facilitates generation of a contextual understanding through the acquisition of in-depth data compared to a quantitative strategy. Blumberg et al. (2011) further suggest that a qualitative study is suitable when the aim of the study is to create a deep understanding of specific entities affection rather than a generalization of a phenomenon, which matches the purpose of this study. Additionally, this strategy facilitates a higher degree of flexibility in the interview setting and a higher utilization of the merging data (Bryman and Bell, 2011). However, the ability to generalize is limited by using a qualitative strategy due to subjectiveness and low possibility of replication (ibid).

3.2 RESEARCH APPROACH

An abductive approach has been chosen due to the ability to modify the literature review after the data collection (Bryman and Bell, 2011). Furthermore, the abductive approach emphasizes the creation of theories and simultaneously reaching the theory, through using inductive processes of observations and empirical findings to serve as a base when recognizing the influences IRMs have on the BM components (Bryman and Bell, 2011). Moreover, the abductive approach further involves elements of deduction as the theory forms and establishes the collection of the empirical findings (Bryman and Bell, 2015). Additionally, it is considered to overcome the weaknesses from the inductive and deductive approach by adopting a pragmatic perspective (Hussey, 2013). The study is based on a case study design, which is motivated by Dubois and Gadde (2001) who argue that the abductive approach comprises understanding suitable for case studies.

3.3 RESEARCH DESIGN

To provide a holistic view of how the different BM components of large manufacturing firms become influenced when implementing IRMs, it is highly applicable with an explorative design in form of a multiple case study. The case study design facilitates access to in-depth empirical findings, which crucially can contribute to theory creation of understudied topics (Bryman and Bell, 2011), and Yin (2009) argues the design as suitable when examining influential factors to explain how and why something is like it is. He further suggests that case studies are able to visualize and explain practical phenomena that can be too complex for other approaches with a requirement of a well-structured design and pre-specified datasets.

By investigating multiple cases, the research enables cross-case analysis to better provide a general understanding, which strengthens the findings compared to a single case study (Yin 2009). Dyer & Wilkins (1991) suggest that the multiple case study might not provide the extensive knowledge about a specific phenomenon that a single case study does. However, the researchers believe that a multiple case study is more suitable to answer the research question and that a single case study would provide a result that potentially lacks scope or ability to generalize to a higher extent.

3.4 RESEARCH METHOD

The research method describes the used techniques to gather the data, which shall guide the execution of the research strategy and at the same time monitor the analysis of the collected data (Bryman and Bell, 2011). The research method will be explained based on what type of data that is collected, primary and secondary. Primary data is generated from new sources whereas secondary data comprises of existing data collected externally (Blumberg et al., 2011; Bryman and Bell, 2011).

3.4.1 PRIMARY DATA

The primary data was collected through qualitative interviews due to the explorative nature of the research and the ability to acquire a deeper understanding of the individual's thoughts (Eriksson and Kovalainen, 2008). The interviews were semi-structured, motivated by its flexibility and the possibility for the authors to guide the respondents into a subject or area without too much influence on the respondents' personal reflections (Bryman and Bell, 2011). Additionally, this technique allows covering a broader area, to obtain richer information, and reducing negative aspects of influencing the respondents' answers much compared to structured interviews. At the same time, the chosen technique enables to maintain a focus compared to unstructured interviews (ibid). Furthermore, the semi-structured interviews facilitate reception of information or discovery of new areas that the authors may not have considered, which provide data to create a holistic picture (Eriksson and Kovalainen, 2008). However, the respondents' answers may vary due to lack of structure which complicates the finding for patterns and link responses, hence the reliability of the study might suffer (Bryman and Bell, 2011).

To ensure that relevant research areas were covered as well as to focus the interviews in an appropriate direction, and to enhance the connection and simplify the analysis between the empirics and theory, an interview guide was created in conformity with the structure of the theoretical framework. All the interviews shared the same purpose and research area, which is why one interview guide was created and applied to all the interviews, which can be found in Appendix 8.1. The interview guide was developed with regards to the theoretical framework and the ability to answer the research question of the thesis. The structure of the interview guide follows the BMC framework since the study aims to answer the research question based on the BMC perspective. The interview guide starts with a brief introduction to the topic of IRMs, in order to ensure that the respondents answer the questions based on a view that is shared with the researchers. The interview guide is adapted to facilitate a semi-structured interview process, by allowing the researchers to choose diverse sequences of the questions/discussion topics. The interrelatedness and the complexities among the BM components have been addressed in the theoretical framework, which is why a visual explanation of the BMC framework, see Appendix 8.2, was developed to facilitate a direction and outer boundaries of the questions per se. A pilot study of four pilot interviews was performed to test the developed interview guide and validate its appropriateness. The respondents of the pilot study were from one of the case companies, each from one of the chosen departments (*Business Development, Sales, Finance & Aftermarket*), but were not the ones who were interviewed for the case itself. The pilot study helped to find shortcomings of the interview guide and improvement areas. The interview guide was adjusted based on the feedback from the respondents participating in the pilot study, as suggested by Bryman and Bell (2011).

Face-to-face (F2F) interviews are recommended by Bryman and Bell (2011) due to the possibility of interpreting additional impressions through the body language. Lewis, Saunders, and Thornhill (2016) further highlight that F2F interviews reduce the risk of misinterpretation. Only twelve of twenty-eight interviews were made F2F due to geographical distances, whereas the others were made through the interactive communication tool Skype, to grasp some of the advantages with a F2F setting by enabling visual contact with the respondent. A large part of the respondents was non-Swedish speaking, but all of the respondents possessed a higher education and an English proficiency, which is why the authors chose to conduct all interviews in English to mitigate the risk that the translation would not fully reflect the precise words as highlighted by Bryman & Bell (2011). Bryman and Bell (2011) suggest recording of the interviews as crucial to enable coding and categorization of the qualitative data, which is why all the interviews were recorded. The recording tool “InqScribe” was used to facilitate a structured way to transcribe the interviews and enable backtracking to enhance the validity and reliability of the transcription. Both of the interviewers participated during the interviews to inhibit the risk that respondents become subjectively influenced by the characteristics of one interviewer (Eriksson and Kovalainen, 2008). Furthermore, voice recording was used to prevent subjective notes or colliding interpretations from letting one of the co-interviewers take notes to ensure focus on the interview and limit distracting factors (ibid). After each interview, the authors summarized the answers in a structured way and let the respondent validate the summary to further enhance validity, which is recommended by Hussey (2013).

3.4.1.1 SELECTION OF CASE COMPANIES AND RESPONDENTS

The process of selecting case companies started with an assortment of several companies who have implemented an IRM and companies that had a wish to do so. Additionally, the companies had to have the following characteristics; 1. *Manufacturing firm*, 2. *Operating globally* 3. *More than 1.000 employees* 4. *Turnover of more than 5.000.000.000 SEK*. These requirements were established based on the characteristics of the companies found in academic papers and to exclude companies that the authors would not consider as representable to answer the research question. Additional to the case companies four experts were chosen based on their previous research within related topics and were found through their published papers. The published papers by the researchers did not address the aspect of IRMs in the same perspective as this study, which is why interviews with the experts facilitate additional value relevant for the study. The companies who have implemented an IRM were found in the academic articles and by searching for different types of IRMs on various search engines, such as Google. The companies who wished to implement an IRM were found through recommendations from authors writing about diverse RMs and BMs, and by contacting companies that the researchers believed to have an interest in implementing an IRM, since they operate in industries where companies offering IRMs could be found.

The chosen companies were contacted by phone and informed about the research to examine their interest in participating as case companies. Due to lack of interest, the number of potential case companies decreased. Additionally, the researchers had a request to perform interviews with four different people with knowledge about IRMs at each of the companies that possessed a managing position within *Business Development*, *Sales*, *Finance* and *Aftermarket* to acquire a holistic picture of the case company. This request further lowered the number of case companies to the amount of six companies, which will be referred to as Company A, B, C, D, E, and F due to secrecy. Information about the case companies is summarized in table 3.1, and a more detailed overview of each company can be found in Appendix 8.3.

Company	Current Offer	IRM Maturity	Product complexity	Product offering	Dealer Structure	Maturity Repair & Maintenance Contract
A	TRM	None	Medium	Engine	External	No
B	TRM	None	High	Transport Vehicles	External & Internal	Medium
C	IRM	Low	High	Machinery	External	Low
D	TRM	None	High	Transport Vehicles	External & Internal	High
E	IRM	Medium	Medium	Machinery	Internal	High
F	IRM	High	High	Engine	Internal	High

Table 3.1. Description of Case Companies.

Each respondent was first contacted by phone to better describe the purpose of the research, and upon acceptance of participation, they were sent an email with more details concerning the interview in terms of content, scope, anonymity, and proposal of time to meet. Moreover, each respondent was sent a meeting invitation through Outlook-calendar with all the previous information summarized and a custom-made BMC attached, see Appendix 8.2, to use as a base for the semi-structured interviews. The attached BMC was motivated to help the respondents to better provide the researchers with a holistic view by having a framework to follow and examples of activities belonging to each of the BM components to facilitate creative thinking. However, for all the case companies the BMC was an established tool, hence the major part of the interviewees had a previous basic understanding of the framework. Additionally, the summarized information enhanced the efficiency of the interviews since the respondents were prepared. All respondents are anonymous and the overview of the interviews can be found in table 3.2 below.

Company	ID	Department of Respondent	Type	Length	Date
A	A1	Business Development	F2F	60 min	2018-03-27
A	A2	Sales	F2F	55 min	2018-04-05
A	A3	Finance	F2F	60 min	2018-04-06
A	A4	Aftermarket	F2F	50 min	2018-04-09
B	B1	Business Development	F2F	45 min	2018-04-05
B	B2	Sales	F2F	60 min	2018-03-29
B	B3	Finance	Skype	60 min	2018-04-03
B	B4	Aftermarket	Skype	55 min	2018-04-06
C	C1	Business Development	Skype	45 min	2018-04-09
C	C2	Sales	Skype	50 min	2018-04-12
C	C3	Finance	F2F	60 min	2018-04-10
C	C4	Aftermarket	F2F	60 min	2018-04-09
D	D1	Business Development	F2F	50 min	2018-04-02
D	D2	Sales	F2F	55 min	2018-04-06
D	D3	Finance	F2F	60 min	2018-04-10
D	D4	Aftermarket	Skype	60 min	2018-03-29
E	E1	Business Development	Skype	50 min	2018-04-16
E	E2	Sales	Skype	55 min	2018-04-05

E	E3	Finance	Skype	50 min	2018-03-27
E	E4	Aftermarket	Skype	60 min	2018-04-12
F	F1	Business Development	Skype	60 min	2018-04-06
F	F2	Sales	Skype	50 min	2018-04-12
F	F3	Finance	Skype	55 min	2018-04-04
F	F4	Aftermarket	Skype	60 min	2018-04-10
Expert	Exp1	Industrial Doctor. Business Model Innovation	Skype	55 min	2018-04-10
Expert	Exp2	Industrial Doctor. PSS Expert	Skype	60 min	2018-04-04
Expert	Exp3	Industrial Doctor. Technology Management	F2F	50 min	2018-04-16
Expert	Exp4	Industrial Doctor. Production Development Expert	Skype	55 min	2018-04-09

Table 3.2. Description of interviews.

The purpose of the study is to acquire knowledge about how the different BM components are influenced by IRMs for each of the case companies, which is why the data from the interviews will be presented in the empirics from a company perspective and not on a respondent level. The company perspective can be ambiguous since it is built upon the culture and people within the company. However, by considering the perspective of several individuals from diverse departments, the researchers try to achieve a fair illustration of the company perspective, but there is still a risk that the respondents may not be able to represent the company picture in a fully accurate way. The choice to apply a company perspective is suggested to further minimize the risk of exposing the anonymity of the respondents, which potentially can affect the outcome of the interviews. Moreover, by creating a unified picture among several respondents, the risk of capturing wrong information based on misinterpretation reduces. However, in some cases there might be diverse opinions among one or more of the respondents of each case company or information only raised by one or more of the respondents, then this information will be presented and highlighted from a respondent level.

3.4.2 SECONDARY DATA

Secondary data in terms of previous reports, papers and case studies were gathered through the use of databases as GUPEA, GUNDA, Business Source Premier, ScienceDirect and Google Scholar. A systematic literature review with inclusion and exclusion criterion, see table 3.3, was created to structure the search process around relevant articles to minimize biases and avoid pitfalls including too much emphasis on a single subject or an article due to its fit with the research objective (Hussey, 2013). Well-cited published articles were used as a base to establish a literature framework of high quality, and to further use the snowball-effect by analyzing relevant references used in these articles. Furthermore, more distinct research criteria and keywords with alternative spelling were

used to find additional data as suggested by Bryman and Bell (2011). Consultancy reports and other sources that were not found in published articles have been excluded in the literature review due to their lack of quality (Hussey, 2013).

Inclusion criteria	Exclusion criteria	Keywords
Literature of published papers + potentially other sources if well cited.	Literature of other types than published papers that are not found in the published papers and are not well cited.	Business Model, Business Model Innovation, Business Model Components, Components of Business Model, Revenue Model, Traditional Revenue Model, Innovative Revenue Model, PSS, PPU, PBH, Power-by-the-hour, Pay per use, pay per usage, pay per outcome, pay per performance, pay per value, usage based contracts, performance based contracts, outcome based contract, value based contract.
Literature of business models focused on conceptualization and discussion about business model components.	Literature of business models with focus on its history and other aspects as the difference between a business model and strategy.	
Literature of revenue model and innovative revenue models that follows the definition from Bonnemeier et al. (2010).	Literature of revenue model and innovative revenue models that do not follow the definition from Bonnemeier et al. (2010).	
Literature about Innovative Revenue Models of manufacturing firms.	Literature about Innovative Revenue Models not relating to manufacturing firms, as pay-per-use services for IT and cloud based business models.	

Table 3.3 - Keywords, Inclusion and Exclusion criteria.

3.5 DATA ANALYSIS

In qualitative research, the analysis of empirical material can be considered as the most intricate part of the process, where the collected data is interpreted in relation to the theoretical framework (Hussey, 2013). Eriksson & Kovalainen (2008) argue that the data collection process shall be established simultaneously as the analysis is conducted to enable the gathering of comments and findings that can be used to strengthen the analysis. No expressed guidelines of how to precisely analyze qualitative research exist (ibid). However, Bryman and Bell (2011) recommend categorization and coding of the empirical findings as appropriate. By this, they refer to find common themes and identifying linkages between the themes within the empirical findings and with the theoretical findings (ibid). The analysis of this study is based on the categorization of the theoretical framework, which uses the structure of the BMC. By having the categories of the BMC as a base for the analysis and use coding to analyze the results within each of the categories, the researchers argue that the process will provide a result of high quality. The coding has been made to find subthemes that later was compared among the empirical findings and with the theory.

3.6 DATA QUALITY

Throughout the thesis, the researchers have aimed to achieve the highest level of quality to ensure objectivity and lower the subjectiveness of the research. To ensure that objectivity is reached, the thesis employs two components of quality; validity and reliability.

3.6.1 VALIDITY

In qualitative research, the term validity refers to “appropriateness” of tools, processes, and data used (Bryman and Bell, 2011; Hussey, 2013). Hence, validity considers whether the design of the methodology, data analysis, conclusion, and answering the research questions are made in an accurate way to measure what it is supposed to (ibid). In qualitative research with case study design it can be hard to generate findings that hold proof of external validity or generalizability, but the degree of external validity is suggested to be improved by using multiple case companies (Bryman and Bell, 2011). The authors argue that the degree of external validity increases by presenting findings on a company level based on validated answers from respondents from the different departments to provide a holistic company perspective. Additionally, since three out of six case companies already have implemented IRMs, the case study is able to present findings based on believed and experienced aspects considering IRMs influence on the different BM components, which is argued to further enhance the external validity. However, with consideration of the chosen topic, the findings of the thesis can only be argued to be generalized for similar cases, firms with equivalent characteristics (ibid). Thereby, external validity is only expected to be partially met.

Internal Validity refers to matching the studied observation with the theoretical ideas (Bryman and Bell, 2011), which creates an opportunity for this study to achieve high internal validity through carefully following the practical guidelines and steps discussed in qualitative methodology literature (e.g. Yin, 2009; Bryman and Bell, 2011). Goetz (1982) argues that internal validity is the strength of qualitative research. By using accurate methods of an iterative and recursive process, and use of triangulation in terms of multiple sources, this thesis is expected to achieve a high degree of internal validity (Bryman and Bell, 2011). By using appropriate tools and involving external considerations from the supervisor as well as other advisors in terms of industrial doctors from Chalmers University of Technology and Research Institutes of Sweden, the face validity is argued to be increased. Furthermore, by using anonymity, respondent validation and pre-testing questions to ensure right interpretations of the research participants, the degree of validity is suggested to further increase (ibid).

3.6.2 RELIABILITY

Reliability refers to replicability of the research and results in quantitative research. For qualitative research with diverse paradigms, the definition of reliability is less clear due to the counter-intuitively of the epistemology (Hussey, 2013). The problem is described by Bryman and Bell (2011) as the qualitative research tries to describe, frame, sense, and codify always changing social

dynamics which by its nature depend on an infinite number of variables, hence it is impossible to freeze the setting to enable accurate replications. The heart of reliability in qualitative research is instead argued to lie with its consistency (ibid). A higher variation of the results is generally accepted in qualitative research since a consistency of methodology and epistemology can generate data that are ontologically similar but might differ in the degree of richness and ambiance within similar dimensions (Hussey, 2013). However, it is still crucial to pursue the highest level of replicability as possible to be consistent with support of quality enhancing methods including verification of accuracy in form of context with constant comparison of gathered data through the use of triangulation (ibid).

This thesis is unlikely to meet the principles of external reliability, due to the problem of generalization based on the replication issue explained by Bryman and Bell (2011) and Hussey (2013). The reliability is further weakened by the interconnectedness among the BM components, which might lead to ambiguity in the answers on how some of the components are influenced. This weakness is limited by providing the respondents with guidelines in the definition of each component, but the aspect cannot be fully mitigated. However, the authors argue that the thorough explanation of the method, procedures, and choices that have been made through the study are likely to increase the external reliability.

This thesis has potential to achieve a high degree of internal reliability through limiting the subjectiveness by; using more than one researcher, validating the answers of the respondents, usage of external advisors, as well as following the recommended procedures to ensure a high inter-observer consistency by ensuring that members of the research share the same interpretations (Bryman and Bell, 2011).

4. EMPIRICAL FINDINGS

This chapter presents the empirical findings from interviews with the case companies and the expert group based on the interview guide. The findings follow the same structure as the theoretical framework, by presenting the influence on the components of the business model by applying the structure of the business model canvas.

4.1 INNOVATIVE REVENUE MODELS INFLUENCE ON BUSINESS MODEL COMPONENTS

The aim of the research is to answer the research question from a company perspective, which is why the empirical findings are presented on a company/expert group level. This means that if several respondents within each company/expert group emphasize equivalent aspects, these will be represented with a citation valid for them all, in order to avoid repetition and ensure the perspective on a company level. However, colliding opinions or crucial considerations will be presented on an individual level which are referred to the specific respondent. For more information about the case companies, see Appendix 8.3.

4.2.1 VALUE PROPOSITION

Findings per company level - Value Proposition

A A currently work a lot with tailor-made offerings for their customers due to their customers' complex engine installations. This value is highly product focused and implementation of an IRM will change the value towards solution focused. *"The value proposition will be changed from having a more product-oriented focus to focus more on a solution offering, hence offering something that creates value in terms of the customers' business model"*. Additionally, the value for A will be more aligned with the customers' value, since they no longer would acquire value from selling spare parts. Thereby, the incentives between A and its customers will be more aligned and the customer can easier predict his business both operationally and financially. *"Today the customer value uptime, whereas we make our profit from downtime, with the IRM we will both strive for uptime"*. The shift from product focus to solution focus was further highlighted in terms of the value proposition change the amount risk the customer is exposed to.

B The traditional value proposition of B has been delivering high-quality transportation vehicles, which often are tailored for their customers. The customer can purchase it with an upfront payment or by renting or leasing it. By offering an IRM, B believes that the value proposition will change to focus on uptime since it is the service in terms of what you solve for the customer that creates the values. *"Uptime is valued by the customer and therefore we can improve our value proposition by delivering that as a solution for their operations"*. Additionally, peace of mind for the customer was raised as a central aspect. *"By providing an IRM and guaranteeing performance or outcome the customer will not have to worry about the risk since it is on us, he acquires a peace of mind."*

C According to C, the value of the customers changes from product focus to focus on complete solutions, where the customer has the ability focus on its core capabilities to a pre-estimated price. *"The customers appreciate to have a peace of mind and to know the cost of the service in advance and that they are connected to his own operations"*. The benefits of the customers in terms of accounting aspects was especially raised since with an IRM, their product offering will not be considered as a leasing or rental

instead as a pure service, which is why the customers do not need to consider the IFRS16 requirement of lifting the machinery as an asset in their balance sheet, which is required for rental and leasing from the 1st of January 2019. *“Our customers are willing to pay a high premium to avoid lifting the assets on their balance sheet”*. Additionally, they argued that their value proposition currently supports the customer BM by having the same objective of uptime.

D believes that they are able to provide the customer with additional value compared to when using a TRM since the customers do not need to be affected with high capital expenditures and are able to work more agile with controlled costs and risks. *“The IRMs will provide the cash flow optimization connected to the customers’ operations as a superiority compared to the benefits of a rental or leasing contract”*.

- D** The value is no longer connected to a specific product that they need to own, instead the IRM creates an ecosystem and a balance among the customers’ costs, revenues and focus areas. *“We do no longer just deliver a product or a service contract, we instead offer a solution where the customer can predict its cost much more accurately and align them towards their own BM”*.

The main change in the value proposition for E was visualized in that the customer is offered a solution and the focus is on the actual input/output for the customer and not the product. One major benefit for the customer is the ability to plan their own business operations in a more accurate way, to ensure budget restrictions and to work with their cash flow. *“We offer an insurance of reliability and a performance that include the product with an adapted payment plan for the customer business. Our customers do not need to have the same upfront costs as before. They are able to better match their cash out with their cash in”*. Additionally, they argued that the overall costs for their customers did decrease, since downtime was very costly for their customers and with this model both them and their customers have the same incentives.

- F** F suggests that the value proposition has changed from having a focus on the products themselves towards a focus where the product is considered as a minor part, and the main focus is towards what the service actually is providing the customer with. *“We offer a complete solution which offers lower risk, where our value is no longer in the product itself it is in uptime and the performance we guarantee”*. Before there was a misalignment in what was driving revenue from the supplying organization versus the customer. Going from a product focus to an operational ability offering with predictable costs was something all the respondents highlighted. *“I guess that the primary change in the value proposition is its focus on risk reduction for the customer. We are no longer offering a product, we are offering efficiency and performance matched with the customers’ operations”*. Additionally, the aspect of convenience and ease of operations for the customers was highlighted. *“The value we deliver is a convenience for the customers, he is able to focus more on its core activity and can easily match his costs with his own BM”*.

- E**
x
p The experts mentioned availability, long-term commitment, and interaction with the customer as central to the value proposition for an IRM compared to a TRM. *“The addition to the value proposition is in form of guaranteed availability. If you sell for example power-by-the-hour you sell availability of the engine”* and *“Two things will definitely be important regarding value proposition. Long-term commitment, e.g. engagement from the supplier will be long term. Changes will happen during the period and the solution provider needs to deal with that. The second thing is regarding interaction. There is of course interaction today, but with an IRM it will have to be a deeper and wider interaction with the customers that use the product”*. Furthermore, they highlighted the offering as more niched to provide a solution that creates value for the customer in a larger scale compared to only providing a product. *“If failures happen, the supplier needs to cope with this, hence the customer can feel more secure with acquiring a solution”*.

4.2.2 KEY ACTIVITIES

Findings per company level - Key Activities

A A emphasizes the need for performing activities as monitoring, cost, price, contract and knowledge management. Additionally, collaboration activities were extra evident among the respondents. *“We need to work more in relational processes with our stakeholders and our customers, where we need to acquire more information about their businesses and operations”*. The respondents all agreed that one of the most crucial activities is to know the associated costs since the risk with this type of RM increases. *“Accurate knowledge about total costs of ownership becomes vital”*. Additionally, follow up and analyzing the contracts was suggested to become crucial. *“We need to know what we promise in our contracts and work more actively with legal aspects. Moreover, predictive analytics and data management are crucial to both follow up and predict our costs which are activities we currently lack”*. A believed that the shift in the value proposition of aligned incentives is likely to affect the design of their products in a way that facilitate better functionality. Additionally, there need to be incentives for the dealer not to misuse the engine and in the case of partners not to replacing too many parts for acquiring additional compensation, which they find as problematic in the existing case with warranty. These risks can according to A be mitigated by having monitoring activities to analyze the using behavior of the customers, but also to monitor which parts that is replaced.

B B believes that when providing an IRM, monitoring of their vehicles will become a key activity since they are responsible for uptime. *“We need to be able to check the condition of our product on a distance to ensure they are working properly”*. They further highlighted the need for monitoring to ensure correct invoicing and to prevent misuse and contractual disputes. Moreover, contract management and risk management was highlighted by acquiring a better understanding for their customers to ensure right contract terms and pricing. *“If we do not manage to price the contract well, we are likely to face losses unimaginable”*. Additionally, B2 highlighted the need for new types of sales activities due to the complexity of the contracts, which was mentioned by the other managers in similar ways.

C Activities that the respondents of C addressed as crucial was management of; Contracts, Risks, Business Cases, Stakeholders, Price, Customers and Costs. *“Activities as monitoring and examining each case/contract becomes crucial so we are able to follow up what is happening and to work more actively with contract estimates”*. Additionally, they highlighted administrative activities as crucial when scaling up their offering of usage-based contracts. *“Administrative support and IT functions that enables an automation level can become crucial since I have heard horror stories of other companies offering services which requires a high administrative burden”*. One of the most required activities was to ensure elimination of silos by having cross-functional activities since there is a higher requirement of internal efficiency. C further addressed that they have started to adapt their products after the IRM, in order to ensure better functionality and easiness in maintenance to maximize uptime. Additionally, they argue that colliding incentives among partners is dangerous and refer to repair activities acquired from external vendors. *“Since we have an external dealer network, and we pay for every working hour and spare parts, the dealer has incentives to replace more parts than necessary if we do not share any risk with them”*. C3 highlighted the importance of funding the RM, and that the activities of revenue recognition become changed. Lastly, C can no longer recognize the revenue upfront, instead they need to recognize it as a service.

The respondents of D emphasized the need for activities to support the value proposition in a way that requires a low amount of effort, otherwise there is a risk of doing activities that require too much effort from the organization. *“A too high administrative burden was one of the reasons to why our IRM for maintenance and repair contract once failed. Automation of administrative activities is crucial”*. D

considers administrative support to be the most crucial activity since without this one the other activities will be for nothing. However, other activities to support the value proposition as; contract, cost, price, risk, and customer management were mentioned. *“Activities will become more continuous than before since we are no longer delivering in a single point of time. We need to learn what the customer is doing and how they are doing it to know if we want to offer them an IRM”*. D further addresses risk mitigation activities by ensuring that all partners and customers do not have colliding incentives, which can be fixed through risk sharing and that predictive maintenance is necessary.

E argues that the work with problem-solving becomes a central activity since the activities need to support the value proposition offered to their customers. *“Activities to support each business case increase in importance, and there is an even greater need for cooperation to ensure the value proposition. Silos need to be eliminated”*. However, since the company was offering service contracts before and worked with data analytics, these do not become new but increase instead of importance compared to before since the penalty of downtime increases. *“Predictive maintenance and monitoring of our products increase in its importance to lower the involved risk”*. The activities of understanding the customers had increased in importance to reduce uncertainty further. *“We need to work closely with contract management and also really know who our customers are. Otherwise, it is easy to enter contracts terms that we think are valid but these might not work in that specific region where the customer operates”*. Furthermore, the sales activities focus more on the value provided and the cash flow impact than just pure focus on the features of the products. The respondents all mentioned management activities for contracts, accounting, financing, cost, price, and risk as important. Additionally, E believed that they would have to work even more with risk mitigation activities if they would have been less vertical integrated to ensure same incentives among them and their partners. One example that was raised was the risk of external dealers to replace functioning parts just to increase their profit, since E would have paid for every need of repair and maintenance.

The key activities switch focus towards activities enabling the value proposition of an uptime delivery instead of having the major focus towards the product itself. *“The focus in our activities switch to problem-solving, which requires activities as system and platform integration”*. Since the company had been offering service contracts for long, they already have activities as connectivity and monitoring to enable this in a sufficient way. They rather saw that activities increase in its importance. Activities as working with predictive maintenance and correct cost calculations are some that are extra highlighted. Additionally, the pricing activity and contract management become essential since otherwise there is a high risk of entering a loss-case. Hence, the activities have more focus on managing the involved risk. *“The activities are much more related to the contract and due its length miscalculation has a much higher affection internally than before”*. The focus within the cost management activities was argued to switch focus to more internal focus than before. *“Before the cost management was more related to production activities, today I would say that there is a greater emphasis on the costs over the contract time”*. Depending on the geographical scope, complexity of the product, distribution channels, and partner network, the activities tend to vary in their importance. A larger geographical scope increases the importance of possessing the right contract management in terms of legal affection but also activities to ensure right spare parts at the right location, compared to if the offering is only towards a smaller region. This company has chosen to offer the value proposition only to possible customers in feasible regions, hence the activities become adapted. F further highlighted the aspect of change in product design activities. *“Modular and simple product design creates benefits with IRMs when offering uptime, which was considered negative when selling upfront, since complex service schedule and requirement of replacing functioning parts boosted our aftermarket sales”*. Additionally, they emphasized that there is a need of mitigating misuse from the operator. *“Monitoring enables us to examine the usage behavior of the operator, which results in that several of cases we acquire a compensation from the customer for not following the contract terms instead of facing cost of repairing the engines when the underlying factor of the breakdown is*

misusage”. Lastly, all the respondents underlined need of efficient administrative tasks for monitoring and sending invoices, since otherwise the costs of maintaining all the contracts would erode a large part of their profit.

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p The experts mention that the company providing an IRM might go on to perform activities that their customers are doing today. *“A company that offers an IRM might take over some of their customers’ operations and even some of their customers’ customers operations. The company moves downstream when they can perform an activity more effective than the customer”*. They also point out that new activities in form of working closer with the customer as the collaboration becomes stronger. *“People that are working towards the customer will have to work on closer relationships as collaboration increases with an IRM compared to a TRM”*. Several departments will have to perform more complex activities with an IRM than with a TRM. *“Purchasing, contracting, cost management, pricing and sales are activities that will change when the RM is altered”*.

4.2.3 KEY RESOURCES

Findings per company level - Key Resources

A Resources as financial, IT systems, and knowledge were frequently mentioned since the IRMs require funding, correct ways to monitor and administer the contract and knowledge in terms of how to adapt each offering. *“We will need resources in IT that we don’t have today, to monitor equipment and invoice the customer. Also resources in terms of partners, and interdependent teams that are able to sell this offer. Funding is crucial, which is something we might need to solve externally”*. Different types of knowledge were highlighted as stakeholder, customer, cost, legal, user, and product knowledge. *“New human resources in terms of teams that centrally working in different departments such as sales, contract management, analytics, and pricing becomes crucial to establish a cross-functional knowledge to allow for integration of these new revenue models. Legal knowledge is required to ensure appropriate definition of contracts”*.

B The sales process for B goes through their dealer network, but they believe that if they should be able to offer an IRM the sales process becomes more complex and they will need additional resources to manage that. *“When selling upfront we use dealers, but to be able to deliver an IRM we will need resources that have the competence to sell it since the sales process becomes more complex”*. They also believe that they will need resources that can handle and make use of the increased amount of data they will receive from monitoring their vehicles. *“We will receive a lot of data from monitoring our products, therefore we need resources that receive and analyze the data. I guess you could call it Big Data analytics”*. Cost and pricing knowledge was raised as essential key resources, including internal funding.

C One of the most required activities was to have a dedicated business case owner that managed the complexity with each business case and ensured that all the departments were working efficiently together, since elimination of silos become more vital. *“New resources as people with the right competence to ensure that the right activities become performed, as for example a Business Owner for each case that ensures the contract terms are fulfilled and act to keep the cost over time within budget”*. Resources that support the activities was mentioned by all respondents, and an extra crucial resource for C was to achieve an appropriate way to fund the RM without affecting their own cash flow or their balance sheet to a high extent, which is why they work closely with financial partners where they sell their products upfront to the financial partner, who later in the name of C distribute the right of use to the customer. They refer to this as a special purpose vehicle (SPV), which is a legal entity created for one very limited, particular task. The SPV act as the rightful owner of the

equipment, hence C's balance sheet affection and revenue recognition becomes less affected compared to if they would own the asset themselves. They further highlighted resources in terms of having spare parts and backup-machinery in stock to prevent high penalties if a longer downtime would occur. However, C4 considered *"Having the right spare parts and backup-machinery in stock becomes more crucial, but in our case, we rent machinery from rental companies if there would be a major breakdown since the value for the customer is the uptime, not the color or the brand of the machinery. By doing this, we need to tie less capital"*. The uncertainty factors were suggested to become reduced through increasing the knowledge about the product lifetime in terms of quality, to know when and where potentially spare parts are needed or how and where to repair to quickly ensure operationality. Moreover, resources to mitigate the risks were highlighted. *"We need to increase the cross-functional knowledge by having IT systems to increase our cost consciousness, awareness of quality issues but also knowledge about our customers to be able to manage the contract accurately"*. C further highlights that their IRM have strict terms and the customer can't experience a full flexibility around the usage due to the risk involved, which commonly can be offered for contracts with plain services, e.g. pay-per-use for TV-subscription or software. Additionally, they highlighted that they are currently unable to sell their IRM offering to some countries as e.g. France and Brazil since it is considered as a financial service, which requires certain permission or financial certificates.

D highlighted appropriate IT system that facilitates automation in the activities, which was a lacking reason when they first offered service contracts based on an IRM that failed. *"It is important that we have a fully automatic system for everything with the administration, because otherwise we will have an administrative mess and need to disturb the customer which will make the customer unsatisfied"*. The respondents further highlighted that the IT resources need to facilitate analytics of data in addition to the administration. Moreover, D put an emphasis on having knowledge in different forms to support the IRM. *"The need for appropriate human capital in terms of employees that can guide the customer through the solution and adapt the offer after the customer needs becomes more crucial due to the complexity of estimating the business case. Hence, these need to be acquired or developed"*. D3 highlighted the need of funding the RM and to have legal knowledge about how the contract will affect them in terms of accounting but also in terms of where countries where this type of RM would be considered as illegal without specific certificates.

The required resources are dependent on what activities that shall be performed according to E. *"Resources and activities are for me very related, resources shall support and enable us to do the right activities. Of course, we need to have resources that enable us to do correct risk analysis, manage the contract terms, and to find the right partners"*. Most of the resources they already had, since they offered service maintenance and repair contracts as well as financial solutions for their products before starting with the IRM offering. *"I do not see so many new types of resources. However, I would say that the complexity of them and their interdependence increases. For example, if we before had accounting and financial resources, they now need to be improved so that they can cope with the additional complexities this new value proposition involves. However, the RM needs to be funded appropriately and bigger contracts need to be governed and managed by a business owner"*. The main difference between TRMs and IRMs is found in the importance of supporting the activities to a higher degree, which requires cross-functional capabilities and knowledge, which could potentially require cultural adjustment within the firm. *"We need to be prepared for replacing the machinery quickly or repair it, which puts high needs on the availability of spare parts. In our case, we have the benefits of renting machinery from our rental company if a major breakdown would occur"*. Furthermore, the respondents argued that the personnel need to be more trained and skilled in this type of sales, they need to have IT systems that manage this type of contract in an automatic way to reduce the administrative burden and to store data so that they are able to increase knowledge about their products, contracts, and customers. *"Resources that enable to store data becomes central since without the data we lose our knowledge and expertise and hence are fumbling in the dark"*.

Due to the organization's maturity within service contracts and long experience in selling these through a usage-based RM, they did not see a specific requirement in new resources, when integrating a product in their offering as well. *“Considering the key resources, I do not see such a change compare to before since we have for long had an aftermarket offering service contracts in terms of maintenance and repair, where we have applied an IRM”*. According to F, it is more like bundling the product and aftermarket support in more complex contracts. However, F further highlighted that some of the resources become more crucial than before and mention for example; contract management, legal aspects, and knowledge about the products, customers and costs. *“Knowledge is a key resource and it can be in many forms, it is vital to have knowledge about contract management, legal aspect of the contract, knowledge about the product and customer, and maybe most important knowledge about our costs”*. The ability to fund the offering was considered as a key resource since the funding of a RM internally was considered as more complex than product funding, which was extra highlighted by F3. *“Resources that are considered as vital are required resources to support all the activities necessary to support the value proposition, for example, this can be the right people with a deeper understanding of the offering, intellectual data & analytics, IT-systems, and a finance capability to enable the offering”*. F4 highlighted the importance of having not only extensive knowledge about the products, additionally resources to ensure its operationality. *“We are required to have resources in terms of hubs with spare parts, appropriate logistical systems and complete engines on the shelf in case of major failures. This is a resource that is costly, but necessary to avoid large penalties due to not delivering what promised”*. F3 agreed but added the requirement of a business owner to ensure that the right resources are available for each contract.

Resources in finance were mentioned by the experts as crucial in order to fund the IRM. *“When the ownership stays with the supplier it becomes more complex financially, therefore companies need resources that are able to handle that and fund the IRM”*. IT resources were also acknowledged by all the experts, but most evident by Exp2 *“I did a case study at a company within remote diagnostics. In order to handle and analyze all data the company had to acquire competent IT resources”*. Exp3 argued that a network of stakeholders has to be considered as a crucial resource since otherwise IRMs will be become hard to manage. Additionally, they all highlighted the importance of knowing the quality of the product and the associated costs over the product lifetime to be able to generate profitable contracts with correct pricing. Exp4 further highlighted that these types of contracts requires legal knowledge to ensure appropriate definitions of the contract terms, as uptime, performance, and value definition. Exp4 believes that these contracts terms may not be as favorable for the customers as it sounds in theory, since for example usage-based contracts with full flexibility will be extremely complex if adapted to products of high value that requires funding, compared to a service as music streaming with a pay-per-use contract.

4.2.4 KEY PARTNERS

Findings per company level - Key Partners

A emphasized a high need of partnerships due to their large dependency on external actors to enable their current value proposition. They argued that the implementation of an IRM would increase their dependencies since their operations need to work even smoother to ensure a high value for the customer. *“The integration with existing partners will probably increase as in the case of our suppliers; OEMs and dealers. However, we need to partner up with financial, legal and insurance companies to enable the IRM, but this might be specific for us”*. The need of financial partners was required to fund the IRM, which was something they were not able to do in-house. Additionally, since they offer engines and not complete products they highlighted the need to work tightly with OEMs to offer solutions based on an

IRM that would create even more value for the customer. *“I would value if I could get a whole vehicle with pay-per-use and not only the engine”*. Due to legal restrictions A is required to collaborate with OEMs to offer their customers an IRM, since as soon as their engine becomes installed in a vehicle or a system, they would lose their right of retention and hence the ownership of the asset. By working jointly with an OEM they would be able to offer an IRM to the customers, another alternative would be to acquire a finished standalone product with their engine and then offer this to the customer with an IRM. Additionally, another possible outcome could be to sell the engine upfront and then offer maintenance and repair contracts based on an IRM. *“The legalization is not updated to enable IRMs for every type of business, which is why the need of partnership is required in our case”*.

B believes that the primary change in key partnerships is that they will need a financial partner that owns the product since the ownership is not transferred to the customer and they do not want to have the value of the vehicle on their balance sheet. *“A question is who will own the vehicle if it is not owned by the customer. I don’t think we can manage to own the vehicle due to balance sheet affection, hence we need a financial partner to do it”*. Due to the larger risk involved with the IRMs the collaboration with legal and insurance partners might increase. *“I see a potential to hedge our risk if we feel the business case becomes too risky”*.

C has experienced a requirement of closer collaboration with its partners and that the customers are more considered as key partners than before. *“The customer can currently be viewed as a partner unlike before since we do not enter this kind of contracts if we do not feel a commitment from the customer and it is an agreement which requires trust”*. In some cases, they offer their IRM through external dealers, and thereby consider the partnership with dealers to reach a higher level compared to before. The respondents all agreed that any additional partners were not evident, but that the existing increased in importance. *“In our case, I don’t see such a difference in key partners more than those who were key before, become even more important, and before this offering we still had to work with financial and insurance institutions, our dealer network, and suppliers”*. Furthermore, they touched upon the need of collaborating around the product development and service offering to enhance the value proposition further, which was not something central to IRMs but might be a vital aspect in the long run.

The increased collaboration aspect was central to the respondents at D. *“There are more complex requirements on the process with partners when you offer an IRM. To sell upfront is pretty simple, you deliver the product and go away”*. D1 highlighted the need of insourcing the sales process, which D4 agreed with *“I don’t think that we will have the same partners in the sales process, I think that we mainly will use our fully owned dealer due to the complexity of colliding incentives and lack of control”*. Additionally, D2 highlighted the need of new partners to fund and to mitigate the risks, whereas D3 underlined that the existing ones can be used and that they only need to change how they work with them. However, all the respondents agreed that the importance of partners would increase.

E does not feel the same needs of working with partners, this since they have their own distribution network and their own financing company, hence are vertically integrated. *“We are not offering this solution through a distribution network we do not control, and we have our own financial provider so I do not see any larger impact here”*. However, they see that the customer becomes more as a partner, in terms of doing a project together since the communication and interdependence increases and that currently the customers and E shares the same objective. *“I would say that our customers can be viewed as a partner since we have a much higher interaction with them and work with the same objective”*. They mentioned for example that they offer a mixture of usage and performance-based contract, where they have a fixed fee for a certain factor and if the requirement of spare parts is less than expected, they share the marginal with the customers. Hence, they mitigate the risks of misuse, which further explains why the customer is considered more as a partner. However, they argue that the existing partners in terms of suppliers increase in their importance.

The requirement of new partners was not vital for this company since they have a very vast organization and is able to use their own finance company for funding and work with large portfolios to manage risk internally. However, they raised the need for more intense cooperation with their existing partners in terms of suppliers. *“Our production process requires a great cooperation with our suppliers since a lot of the activities are outsourced, hence we had a great need for a partnership before”*. Additionally, there was an emphasis that the customer interaction becomes more continuous and the business exchange is more visualized as a partnership. *“The customers can be viewed as a partner since you continuously work with them, and tension or issues will have great negative impacts for both sides”*. Moreover, the respondents highlighted the need of maintaining the legal aspects of the contract where legal partners are necessary if not the resource exists internally. F further underlined that they would be in need of partnership with the OEMs to enable the IRM for other industries than they currently operate in, since in their industry the engine constitutes a legal entity, which is why they do not lose the right of ownership.

All of the experts believed that the customer would become a partner since the relationship with the customer becomes closer with an IRM. *“When offering an IRM to a customer there will be a closer relationship and therefore the customer can be seen as a partner”*. Exp2 further believes that new partners might arise that companies have not thought of before. *“There could be entirely new partners entering the market. For example, as Uber is a completely new partner to Volvo”*. Exp3 argues that new partners related to product development is not unique for IRMs, however working with insurance, financial and legal partners may be new for several firms, but the larger industrial firms already do this. However, they all considered the existing partners to increase in importance since collaboration is central to acquire efficiency in reliability, which is required for firms offering IRMs.

4.2.5 CUSTOMER SEGMENTS

Findings per company level - Customer Segments

According to A, the target customer group is not likely to change since they have segmented their customer with a product-oriented view. However, IRMs might only be applicable to some of their existing customers within the segments due to the aspects of financial strength and involved risks. *“I don’t really see a difference in the customer segments when offering an IRM compared to our current RM, more than we only would be able to offer this to some of them due to the risk involved”*. However, the respondents further argue that there might be a possibility to acquire new customers within the appropriate segments. *“We will probably not find a new customer segment, more likely to gain new customers within the existing segments instead of losing them to our competitors”*. The current segmentation based on a product view where every type of customer that uses that specific product can be categorized, hence they have a broad customer segmentation.

B believed that the customer segments will probably stay the same, but some of the customers might not be considered as appropriate due to risk. *“They most of our existing customer would be interested in an IRM, but there has to be a match between the acceptance in financial risk and premium charged”*. However, the respondents do not think that the IRMs are applicable for every customer segment due to risk and other complexities, but have a potential to attract new customers within the appropriate segments.

The customers that C currently offers an IRM are key accounts. C further argues that the customers need to fulfill certain characteristics to manage the high risk with these types of RMs. *“We are currently only offering this to our large key accounts who have an appropriate BM for this type of value proposition and RM. However, in the future, I believe with maturity our offering will be more applicable for other types of customer within existing segments or maybe even new segments”*. The

respondents further highlighted that C currently is very narrowed in its segmentation of customers, which could be a reason to why new segments may arise. Additionally, the main parts of their customers are not doing this for the convenience, instead they are willing to pay premiums for avoiding balance sheet affection. *“To avoid the affection from IFRS16 considering balance sheet affection, our customers are willing to pay a premium that could increase our margins by 100 % compared to selling upfront”*. The respondents further highlighted that C might attract new customers but it has to be within appropriate segments otherwise the business case becomes too risky.

D suggests that the target audience is likely to be customers within existing customer segments and the amount of entered business cases will depend on the associated risk. *“I don't think all our customers are interested, but I don't think that we want to offer it to all the interested customers due to the risk involved”*. The respondents argue that the target audience may be niched in the beginning but may increase with maturity. *“In the beginning, I think these models are most relevant for companies that are financially strong and willing to pay the higher premium we need to charge to manage our risk”*.

The IRM is not offered to every customer segment nor all customers within a specific segment. *“We do not offer this to whomever, there needs to be a substance and a match between what kind of risks that are involved with the specific customer”*. However, new customer segments and customer types have potential to emerge due to the IRM, but these need to be managed carefully according to the respondents. *“Selling to the wrong type of customer or segment can be devastating but finding the right ones enables us to maximize value for us and the customer, hence a rigorous analysis is required before any contract can be signed”*.

F only offers their usage and performance-based RMs to customers with a manageable risk profile. *“It has to be a balance between the risk and the profit, hence this is only suitable for some of the customer”*. Hence, their offering is limited to the customer type but also to geographical regions due to the requirement of supporting distribution channels. *“The offering becomes niched in terms of where we geographically are able to offer the value proposition, for example where we do not have the same distribution network and availability of spare parts the contract might become too risky”*. However, by maturity and volume F has been able to offer their IRMs to an increased target group.

The general opinion among the experts is that IRMs will not have any real influence on customer segments, however, all customers within a specific segment might not be appropriate. Exp1 *“IRMs are for sure very attractive for the most of the existing customers, potentially for new ones as well. However, I do not think that companies will sell to whomever due to the risk”*. Exp2 *“IRMs will be possible for most customers so I do not see a difference in customer segments”*. Exp3 *“IRMs is not likely to be appropriate for everyone within the current segment due to risk aspects”*. Exp4 *“IRMs may appeal much more customers than the companies would like to sell to, customer segmentation becomes more crucial compared to TRMs due to the risk”*.

4.2.6 CUSTOMER RELATIONSHIPS

Findings per company level - Customer Relationships

The respondents all believe that customer knowledge is the key to successful IRMs, which is why the interaction needs to intensify to ensure the right value delivery and to mitigate the risk involved. *“We must work tighter with our customers to create correct contract terms and value”*. Additionally, they consider the customer to become more as a partner, and by better understanding, they will have potential to find gaps in the customer's BM to add further value. *“If we are able to understand our*

customers better we can provide them with better contractual conditions by lowering the involved risk, it becomes a win-win situation". However, the main influence on customer relationships is that it will intensify, since A already works actively with tailor-made business models and value offering to their customers.

B argues that closer collaboration is central to IRMs since these complex contracts require open communication and trust. *"We do not want to enter a contract based on an IRM with a customer we cannot trust"*. Furthermore, the respondents argue that knowledge about the operations of the customers is crucial to adapt the IRMs and contract terms in a satisfying way, and how they work with customers need to change. *"We need to learn their business to provide the maximum value delivered and to lower our risk"*. They further suggest that to acquire the knowledge, the relationship has to become a partnership, which is something they currently do for some of their customer segments to which they offer tailor-made business solutions.

C is only offering IRMs to their key accounts, which are the customers they have a good relationship with. *"I would like to say that an extremely good relationship with the customer is vital. One needs to know their operations on an accurate level, to ensure creation of a win-win situation"*. Additionally, they mentioned that in their case the relationship has mainly increased, since the key accounts was prior to the IRM already offered tailor-made solutions. However, the IRMs create complex contracts, which they do not enter with strangers. *"Customer understanding enables us to avoid disputes that requires effort and additional administration"*. C suggests that the relationship building needs to start as early as possible to quickly be able to examine the possibility of an IRM. *"We need to work with the customer from an earlier phase, to be able to create a value proposition that is adapted to the customers' needs. The process becomes change from finding customers adapting to our finished products to collaboratively create offerings adapted for the customers"*.

D emphasize that the need for understanding their customer will increase with an IRM. *"With a TRM, we have what you can call an arm's length relationship with our customers. With an IRM, we will have closer a relationship with our customer and more of a collaboration, which will be required in order to support the RM otherwise we will face too high risk"*. The respondents further argue that the relationship with their customers would be more as a partnership *"The customer relationship becomes crucial, and the relation is more as a partnership"*, and that the knowing the customer is crucial to support the value proposition. *"We need to know our customers on a higher level, otherwise we are unable to examine our value proposition"*. D further address that the influence on the customer relationships is likely to depend on customer segments, since some segments they already work very close with, hence they would experience a minor impact.

E The interaction with the customer was already high before since they worked a lot with tailor-made business cases and service contracts according to the respondents. However, E argues that there is a need for even higher integration and deeper relationships with the customers than before. *"Our contract terms require deep knowledge about the customers which only can be acquired through tight relations, otherwise it would not be applicable to offer an IRM"*. Furthermore, they all highlight that relationships are not only important to lower their risk but to further enhance what they can offer their customers, which was exemplified by E1. *"By understanding the operations of the customer better, we have been able to offer more attractive usage-based contracts, where we additionally have been able to combine these with performance parameters to increase the benefits for the customer even further"*. E4 highlighted *"Our customers that are offered IRMs, cannot be considered as pure customers, they are our partners"*, this picture was also shared among the other respondents.

The respondents argue that customer relationships become extremely important since there has to be a match with the right customer to offer the value proposition, exemplified by F1. *"To maximize the*

customer value it is essential for us to know the customer business, and to find where we are able to help and create value for them, thereby to work closely with our customers become more crucial”.

- F** Additionally, the respondents consider the value proposition to be further enhanced by having a better understanding for the customer business, which often is achieved through a close relationship with the customers, exemplified by F2. *“The understanding of the customer and insight in his business becomes a more vital aspect, hence we need to see the customer more as a partner”.* F further considers that an extensive understanding is required to lower their own risk of the business case.

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P All experts agree that the customer relationships will become closer. *“Relationships will have to become closer to the customer, like a partnership. It is about building long-term relationships and creating continuity”.* They also suggested that the relationships would begin in an earlier phase than before, where normally the relationship exchange started when to products were sold to the customer. Exp4 highlighted this by stating *“Interaction will happen during all phases, from development to launch”.*

4.2.7 DISTRIBUTION CHANNELS

Findings per company level - Distribution Channels

- A** The respondents of A believed that implementation of an IRM are likely to put requirements of new channels for communication and collection of data, which can be exemplified by A1. *“New channels for communication needs to be developed, additionally, channels for monitoring through connectivity and remote services are required”.* A2 *“We need better communication channels to reach our end customer than we have today”.* Additionally, A sees a need to manage their distribution channels more efficiently since downtime become crucial and that they no longer would be able to let their external dealers manage the sales process on their own, instead, it has to be a collaboration to ensure an appropriate sales process and efficient logistics. *“We are dependent on our dealer network, otherwise we would have no chance to distribute our engines or spare parts, and this dependency will increase with IRM”.* They further highlighted that a trustful network of distribution partners is essential, and it is crucial to have shared incentives and perform risk mitigation activities to ensure that external service dealers do not replace parts just to make profit.

- B** B considers the sales channel to differ and how the communication with customers is performed. *“The sales channel will change as we can’t use our external dealers to sell this offer, it must be done by more highly competent people centrally”.* They see a need for cooperation among the distribution channels to ensure efficient logistics. *“To distribute spare parts effectively becomes much more crucial due to the affection of usability and performance”.* A4 further highlights that he would not be sure if they would offer an IRM if they did not have their own dealer network, and highlights the risk of external dealers making additional profits by replacing “healthy” parts.

- C** The respondents highlighted improvement of communication, *“The communication process needs to be improved, we need to mediate an understanding and creating a need even if the costs when the customer adds them up may increase the costs he paid before”.*, and overall quality of the distribution channels, since the IRMs put a higher requirement on their dealers which results in that C has to take a central part in the sales process to the end customer. Furthermore, they emphasize a need for different sales teams that have a more financial mindset than technical sales and to speak with customers that understand cash flow. *“The sales process need to facilitate a more financial mindset than technical sales, it is important that the customer understand the financial advantages and disadvantages, since it is easy to misinterpret these complex contracts. We thereby need to take a*

more central role in the sales process to the end customer and cannot at the moment depend on our dealers”. C4 highlighted the need for ensuring functionality through right channels for monitoring but also to ensure efficient channels for managing the logistics of spare parts.

D believes that it will be hard to offer IRMs through external dealers. *“External dealers do not have the time, possibility or the knowledge to manage this. We will have to do it centrally or at least at a higher level in-house or with actors that we really trust”*. Additionally, they considered that the channel for information will change to more digital for information and monitoring of their vehicles and that improved channels for communication are vital.

E The process of how they work with the sales processes has changed according to the respondents. *“The different phases of the communication, need to be deeper explained and analyzed, since the complexity of this contract type increases. Additionally, you need to ensure that you communicate with a person that understands the value of the revenue model”*. E highlights that they only offer these complex contracts internally, and not through external distribution channels which are used for sales of low volume and minor machinery. However, external dealers can be used to quickly assess spare parts, which increase in its importance.

F The distribution channels themselves do not become heavily affected according to F since they already have a very rigorous distribution network which is fully owned. However, they experience that they need to put much more emphasis on communication with different context compared to upfront sales. *“It is more of the business perspective involved in these type of setting, which requires an economic understanding from the customer. Thereby, a different kind of sales team and sales approach is required”*. Their customers use their engines between fixed points, which simplifies their requirement on distribution channels, however, their hubs for spare parts constitute guidelines for where their customers are allowed to use their engines since the logistics has to be managed effectively. However, F4 highlighted the difficulties if they would have outsourced their distribution network due to the complexity of the IRM.

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p The experts recognized that large manufacturing firms usually have a dealer network as their distribution channel, exemplified by Exp1 *“I believe that the IRMs that we discuss are for business-to-business, and that is often done through some kind of dealer network”*. However, they believe that the manufacturing firms have to increase their interaction with the dealer to support and enable these new IRMs, exemplified by Exp3 *“Explaining contract terms, cash flow affection, benefits, and disadvantages requires extensive communication and knowledge, which I doubt that the most dealers of manufacturing firms possess. Thereby, I think the manufacturing firms need to enhance their engagement, but also since they want to have a higher degree of control due to the risk”*. Additionally, all four respondents believed that a general influence was a requirement of greater communication channels, and Exp2 and Exp4 also highlighted the need of having an efficient way of monitoring the need of spare parts and to distribute it.

4.2.8 REVENUE STREAMS

Findings per company level - Revenue Streams

A A highlights the fact that their revenue streams will change from upfront to become recurrent, they further believe that a usage-based RM is able to increase their profits by capturing a higher penetration from the aftermarket. However, A4 was skeptical *“We can no longer consider sales of spare parts as revenue for these type of RMs, it shall be considered as a cost, which is why the pricing*

becomes much more crucial". In terms of the risk they all argue that revenue change in terms of being known and fixed, to fluctuate and become uncertain, but also that there was a potential for the revenue streams to increase. *"The risk premium is likely to increase our revenues and penalties from our customers for not fulfilling their part of the contract, but the failure of uptime can provide us with a lower amount of revenue streams and additionally increase our costs"*. A3 added the negative aspect in terms of revenue recognition that smaller recurrent revenue streams will have, and that he was not sure if their investors (shareholders) would like this.

The respondents of B suggested the possibility to acquire an increased amount of revenue streams due to the bundling of a product service contract with additional revenue that the customers pay for the convenience and peace of mind. *"We are able to capture an increased amount of revenue streams, but we also face the risk of lowering our revenues and increasing our costs if we do not deliver as promised"*. Additionally, B3 added another financial aspect *"Since the revenue streams are no longer upfront, instead of distributed over time, we need to work much more with pricing to ensure that the total revenue streams, discounted to today's value, exceed the costs"*.

C confirmed that their revenue streams had increased since they started with IRMs. They further highlighted that they have not faced any additional costs related to maintenance and repair, or penalties, which was explained by the short time they have been working with IRMs and that their uptime currently is around 99.7 % for their usage-based contracts. All the respondents further addressed that their focus cannot only be on increasing revenue streams anymore since the additional price is related to additional risk. *"Before increased revenue streams were correlated with higher profit, currently we have a higher uncertainty in our costs which is why the profitability calculation becomes more complex"*. Additionally, one of the major things, why their customers was willing to pay extra for their RM, were the accounting benefits for the customers *"Our customers are willing to pay a lot more for peace of mind and to avoid the requirements of IFRS16. However, IRMs make the business control harder in terms of allocating the revenue recognition to e.g. depreciation of the machines. Since the revenue recognition is impacted, we experience different financial result for different periods, but with a larger portfolio this aspect can be mitigated"*. C worked with long financial plans for their customers before, but they highlighted that the uncertainty factor of IRMs with having recurring payments over time, creates a more complex business case, where pricing becomes more complex to ensure a positive net present value of the contract. Thereby, the contract terms have a "least allowable usage hours" clause for their usage-based RMs to reduce some of the uncertainty. C3 highlighted the risk of acquiring lower revenue streams if they not would be able to provide the promised uptime, performance or value. Additionally, C4 underlined that that these contracts change his work upside-down since spare parts consumption is no longer a revenue.

D underlined the increased risk in IRMs since with usage-based RMs the revenue streams will become more recurrent if the customers use the vehicle, but with performance and value-based RMs the revenue streams will only be recurrent and collected if the delivery meets the requirements. *"With an usage-based RM, the initial payment is lower or does not exist but is distributed over the continuous revenue streams. The total revenue will hopefully become higher by offering an IRM, but there is a risk of smaller revenue streams due to the uncertainty of penalties"*. Furthermore, D highlighted the uncertainty factor, which was extra addressed by the D1 *"Our revenue streams become more uncertain in their nature, which is why associated cost need to be predicted well and that the pricing is connected to this. Wrongly priced contracts that run for several of years can have a tremendous impact on the profitability by capturing too low revenues compared to costs"*. D3 added *"No upfront revenue, means no upfront revenue recognition. We need to recognize everything as a "service" over the contract period, which affects our financial result in a negative way in some periods"*.

E argued that they have increased their revenue streams thanks to providing a peace of mind to their customers. However, the increase in profitability was not evident. *“The revenue streams are affected in many ways, mostly positive but we must not forget the additional increase and risk in our costs structure. The main difference is that we no longer have certain upfront revenue streams and that spare parts do no longer generate revenue”*. E3 highlighted that he favored the TRMs due to less complexity and uncertainty with the revenue streams but further underlined that with the TRMs they potentially would lose the business case to cheaper competitors. E1 explained that with the IRMs, they have potential to increase the revenues, but they have to ensure that the costs do not follow. E2 stated *“In the beginning, we struggled to price the contracts appropriately, and additionally faced some penalties. This resulted in lower revenue streams for some business cases, but with maturity, the pricing has become more accurate and the amount of penalties has decreased”*.

Since F started with usage-based and performance-based RMs they have been able to increase their revenue streams and additionally lower the total costs for several of their customers. *“We can currently acquire a much higher total revenue than before, however in the beginning, we struggled, especially with business control affection due to the low amount of IRM contracts sold. The reason for why we struggled, is because when not selling a product upfront anymore, we are not able to recognize the revenue directly, we need to recognize it upon usage and follow the rules for services”*. The change in the revenue streams was highlighted by the risk aspect. *“Considering the revenue streams we become affected and we will have more of a recurring payment where we have a potential to increase the total revenues if everything goes well. At the same time, we have a risk that our revenues will be lower in comparison to our costs due to penalties and increased costs”*. The aspect of not acquiring a large sum upfront was highlighted as negative since it will increase the organization in terms of increased costs. *“The change in the revenue streams from being upfront to become recurrent requires additional costs.”* F4 highlighted that consumption of spare parts is no longer equal to revenues as before.

The revenue streams will increase if risk mitigation is offered to the customer. *“I believe that the customers are willing to pay a premium for the risk mitigation included in an IRM and therefore the total revenue for each deal will increase, however, it will be distributed over time”*. Even though most of them claim that the revenues will be received later without an upfront payment, for some businesses it will result in that suppliers will receive revenue earlier than before. Exp2 *“In the aerospace industry where I have done research revenue is actually received earlier when offering an IRM since the revenue streams are coming in from when the airplane is in the air, they don’t have to wait until service and repair is needed. This was in the case of GE and Rolls-Royce”*.

4.2.9 COST STRUCTURE

Findings per company level - Cost Structure

The increased costs were central among all the respondents of A, who argued that due to the complexity additional activities were required which will induce more costs. *“We need to invest in IT-systems to administrative these IRMs and other resources to support the required resources which will increase our costs”*. The respondents highlighted a shift in the cost structure from being certain and mostly related to production activities to become uncertain and dependent on the total cost of ownership, since the need of spare parts would no longer be considered as a revenue, instead as a cost. However, A believed that some of the costs could be lowered *“There is a possibility to decrease costs for repair and breakdown, additionally for warranty when our engines experience more appropriate service. However, this might demand increased investments in product development”*.

Considering the cost structure B was not exactly sure how about this would change, more than increase in uncertainty. However, B mentioned that some of the costs are believed to increase. *“Cost for administration, IT-systems, and other required activities are important with this type of revenue models which is why the costs, in general, is likely to increase”*. Additionally, the B highlighted that costs associated with spare parts will now affect their cost structure and not the customers. B3 highlighted another aspect neither of the other respondents mentioned *“The funding will be much more costly, especially if we want to discount some of the value upfront”*.

C experiences higher costs due to uncertainty and risk within their cost structure after implementation of IRMs. *“The add-on risk for organizations is well mirrored in the costs structure. Before we were able to estimate our costs based on production activities, currently our costs need to be re-estimated constantly due to fluctuating risks in each of the contracts and that the costs follow the whole contract period”*. Additionally, they find their costs to have increased in general but have faith in that warranty costs will decrease due to the strive of uptime which influences the product development. *“With this RM our motives to decrease the costs of warranty becomes increased”*. Several of the added costs are related to supporting activities necessary to enable the IRMs according to the respondents. C4 argues that *“Our costs structure does no longer mainly relate to production activities, currently it is more related to activities that support our revenue model as; IT system, administration, risk management and spare parts”*.

There was a perception that the cost structure will be affected in terms of what drives the costs. *“Our costs will no longer be our internal costs related to production, a part of the costs will appear from the increased need of internal and external activities to support our RM and ensure fulfillment of contracts. How much we do on our own and what we put on our partners affect the costs.”* Furthermore, additional costs related to revenue recognition are likely to emerge, since a satisfying result was a requirement from the Managing Board and their shareholders. *“If we do not longer sell our products upfront our revenue recognition becomes negatively affect, which is an aspect crucial for our investors. We need to recognize the revenue during certain periods to provide a satisfying result for our shareholders”*. D3 added, *“The uncertainty in our costs increases. The inherent risk put a higher need for new activities required to support our revenue model”*. D4 further highlighted that the consumption of spare parts will be considered as cost.

E’s cost structure has changed to become more uncertain, hence has their associated costs increased to deal with the risk which required new supporting activities. *“We are no longer able to plan our costs in the same way due to the associated risk, which affects our budgeting work negatively and creates a more complex business control situation”*. Additionally, a larger part of their costs is associated with maintaining and supporting the RM than before. *“Our costs for the production process does not immediately change, and since other costs have increased we have a shift in the central allocation of costs towards activities close to the RM instead of production. However, we see that the costs for warranty have decreased due to that appropriate maintenance is made, but we now face the cost of this maintenance and repair”*. E3 mentioned that sometimes they need to use external insurance and financial companies to discount a part of the contract value to increase their financial numbers, which is much costlier than selling an invoice with a payment plan for 180 days.

The cost structure has changed and increased for F due to the additional risk within the contracts. The need of spare parts was before beneficial for the company in terms of revenue streams, but with their IRM it becomes a cost for the company. *“When selling spare parts upfront, we would be able to prolong the process if we have issues with our suppliers. With this model, we need to ensure that our suppliers prioritize our material since otherwise, we will face increased costs”*. Furthermore, structuring of the costs becomes even more important and they have experienced that a larger part of the total costs is constituted by supporting activities compared to production activities as before.

However, the associated costs in terms of warranty claims have decreased since the correct amount of repair and maintenance is performed. Additionally, they highlighted the costs of IT-systems and funding as central.

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p All experts agreed that costs for administration and IT-systems supporting the RM will increase since new activities and resources are likely to be needed. There will also be a change in terms of service and repair that previously was an income, and with an IRM it will become a cost when the supplier receives the same payment regardless of much he spends on service and repair. *“The view on costs for spare parts changes with an IRM. Previously spare parts were associated with revenue but now it is a cost. Correct service of the products has potential to lower the warranty costs”.*

4.2.10 DEGREE OF INFLUENCE

Which of the components do you consider as being the most influenced by the shift from a traditional revenue model to an innovative revenue model?

- A1 *“Key activities are where I see the biggest change. Also, revenue streams change but key activities is probably the primary component.”*
- A2 *“I would rather say more three than one; customer relationships, cost structure and revenue streams.”*
- A3 *“I believe we will see the biggest change in the value proposition, key activities and customer relationships.”*
- A4 *“I think where we see the biggest impact is in the value proposition and our activities with coping with new types of partners since we need to change our entire organization in how we work and what we offer.”*
- B1 *“Value proposition is the most influenced, but the other components must be there to support.”*
- B2 *“Value proposition and the cost structure will be the most influenced.”*
- B3 *“I consider that our revenue streams will change, but I would say that our costs and value proposition will change more.”*
- B4 *“I think this the question is hard to answer due to the interdependencies, but in our case, I think that our key activities will be mostly influenced.”*
- C1 *“The question is tricky since I think that the influence occurs in different steps. For example, the organization needs to put a lot of time in the components as Customer Relationships, Customer Segments and Distributions channels in the beginning, whereas later focus more on the key activities, key resources, and key partners to enable this value. But considering where the major difference is I would say that the value proposition is completely different than before, and also the revenue streams.”*
- C2 *“I would say that our value proposition has changed the most, and our costs and revenue structure.”*
- C3 *“For some companies, I think that the key activities will change the most, in our case I would say the way we work with our costs and revenues.”*

- C4 *“I am not really sure, maybe our resources.”*
- D1 *“The most of the required activities to enable the IRM, we already do as of today to some extent. Then I refer to activities as working with funding, insurance, contract in different forms. Thereby, I see that the most change is within the value proposition and how our costs structure and revenue streams.”*
- D2 *“For us, we will need to work more closely with new banks and insurance companies, but I think that for example key activities and value proposition is affected much more.”*
- D3 *“I see the biggest change in the revenue streams and costs structure which is of course affected by the changes in the value proposition.”*
- D4 *“Every component will become affected, but it all starts with the value proposition.”*
- E1 *“The value proposition becomes heavily changed, where we go from offering more a product with a separate service contract to a complete offering were we mitigate the uncertainty in the cost and risk exposure.”*
- E2 *“Even if the activities themselves not change in their art, we might need to work more intense with them to deal with for example risk management.”*
- E3 *“Our cost structure and revenue streams become affected to a high degree, since the reciprocal risk swap from the revenue streams to the cost structure.”*
- E4 *“I would say that our value proposition is affected the most.”*
- F1 *“Several of the components do not become so influenced by additional activities instead they increase in its importance. However, there is a difference in the mindset and to think in terms of “value in use”, and the value that is delivered. Thereby I would say that the most change occurs in the value proposition.”*
- F2 *“What we offer for the customer is completely different than before, so of course I would say that the value proposition is most influenced. However, for other organizations, it may differ, since I personally think it depends on the organization and the type of products you are selling.”*
- F3 *“I do see the value proposition and cost structure as the components that become the most influenced.”*
- F4 *“The value proposition, cost structure and revenue streams.”*
- Exp1 *“My view of the BMC is that it is interconnected so I would rather say that it is changing the order of the components by switching revenue model.”*
- Exp2 *“It is probably cost structure and revenue streams that are turned backward. Customer relationships become more important. Value proposition changes.”*
- Exp3 *“I believe that long-term business relationships, as well as depth and width in the interaction, are the most important factors, so I guess that it is value proposition and customer relationships.”*
- Exp4 *“I would say that the key activities will change the most and of course the value proposition.”*

Which of the components do you consider as being the least influenced by the shift from a traditional revenue model to an innovative revenue model?

- A1 *“I think that every component will become affected, but the ones that become the least affected are; Cost structure, Customer Segment and, Key partners. However, the influence on key partners may increase if the company have not work closely with their partners before”.*
- A2 *“Customer segments since I don’t really see a difference.”*
- A3 *“I think our customers will mostly be the same in the long run. However, we might not be able to offer an IRM to every customer in the beginning, but with time we will learn, lower our risk, and hence enable a broader target group. Thereby, I would say customer segments to be the least influenced.”*
- A4 *“As I see it cost structure will remain pretty much the same and therefore I think it is least influenced.”*
- B1 *“I think our key partners will be the same and might only change in how we work with them, hence I do think this is influenced the least compared to other components as Key Activities, Key Resource, and Value Proposition.”*
- B2 *“We already work closely with our customers, we will only work even closer and that is not such a change compared to how the value proposition or cost structure is influenced.”*
- B3 *“I do not see such a change in customer segments.”*
- B4 *“I can’t say any specific, all are influenced.”*
- C1 *“This question is also hard to answer as the previous one. But the least influence component, in our case, I see in how we work with our key partners now compared to before, since we already worked closely with them but this picture may not be shared with other companies.”*
- C2 *“I do not see such a change in our customer segmentation, compared to that we only offer our key partners at the moment which is an active choice we made.”*
- C3 *“Our key resources change since our key activities are changing, but considering the customer relationships, I do not see such a change. The only thing that is different is that we work much closer with them, but we still worked close before since they were our key accounts.”*
- C4 *“Key Partners are still the same as before, however, they increase in its importance.”*
- D1 *“We will probably have the same customer segments with an innovative model so I have to say that it is the least affected.”*
- D2 *“We probably have the most of the resources already, what we need is to enhance the required resources to an appropriate level and to outsource those we cannot manage. Thereby I do not see that the key resources will change heavily compared to what we already have today.”*
- D3 *“I see the least change in how we work with key partners and key activities since we already work tight we just need to intensify.”*
- D4 *“I would say that the customer segment becomes more influenced in the beginning, but with the maturity of IRMs, we will be able to offer these to more customers, hence I see that this component*

becomes the least affected in the long run.”

- E1 *“I don't see any specific need for new partners in our case, hence I see this as an area with the least influence.”*
- E2 *“The most of the components are affected to a certain degree and it is hard to exactly tell which is affected the least, but I don't see that the customer segments is affected more in that we only offer these IRMs to key accounts at the moment.”*
- E3 *“I do not possess the right competence to determine exactly what component has the least influence.”*
- E4 *“The process of working with customers, I think considering the process of customer segmentation but also key partners might not be so influenced in a later stage. Of course, there will be new key partners, but this is depending on the company.”*
- F1 *“In the beginning we became hindered to offer our IRM to all our existing customers, due to the involved risk, hence our customer segment was influenced. However, with maturity we have managed to decrease risk and currently we are able to offer the IRM to customers with similar characteristics as we sold to when selling upfront.”*
- F2 *“Key partners are affected the least according to me, at least in our case. But this can be highly company specific if you never have worked with e.g. financial institution”*
- F3 *“I think that in the future we are able to sell to almost all our customers if they have a good financial health, so I do not see that the customer segments become more influenced than it requires a higher credit ranking.”*
- F4 *“I do not see such a change in our distribution channels more than we have increased our capacity, but that relates more to the resources according to me. Additionally, I do not see such a change in customer segments.”*
- Exp1 *“Unable to answer due to interconnections among the components.”*
- Exp2 *“Every component is influenced, but key partners will probably remain the same.”*
- Exp3 *“I don't see such a change in distribution channels, however, it depends on how deeply the company has worked with channels that support IRMs before. But I think the most of manufacturing firms that see a potential in IRMs, already have the basic settings.”*
- Exp4 *“I do not see such a change for customer segmentation and key partners.”*

4.2 EMPIRICAL SUMMARY OF IRMS INFLUENCE ON BUSINESS MODEL COMPONENTS

Summary of IRMs influence on the BM components according to empirical findings	
What value is delivered	
Value Proposition	<ul style="list-style-type: none"> • Creates a solution-based orientation for the customer, where the generated value becomes a more vital part. - A, B, C, D, E, F, Experts • The customer acquires an insurance of availability and performance, which could be expressed as peace of mind that enables additional focus on the customers' core capabilities. - B, C, F, Experts • An alignment of objectives occurs which is likely to improve the value proposition additionally for the customer. - A, C, E, F • The customer can more easily plan his operations due to increased capability of predict costs. - D, E, F • Additional accounting related value since the customer does not need to lift the asset on the balance sheet compared to TRMs according to IFRS16. - C
How value is created	
Key Activities	<ul style="list-style-type: none"> • Monitoring activities of the products to acquire knowledge about product status, user behavior and input/output delivered becomes central. - A, B, C, E, F • Predictive analytics/maintenance of products is central since the RM is based on reliability of the products. - A, D, • Cost management to increase knowledge about general costs and costs associated to the lifetime of the product are crucial since the profitability of the RM depends on this. - A, C, D, E, F, Experts • Pricing activities increases in complexity and at the same time it needs to become more accurate since the revenue streams become uncertain. - A, B, C, D, E, F • Contract management is central to IRMs, which requires additional activities as pre-study of the business case, legal analysis and follow-up activities. - A, B, D, E, F, Experts • Collaboration and relational activities becomes more crucial since the business exchange becomes continuous. - A, C, E, Experts • Acquisition of customer knowledge and business case evaluation to enable problem-solving activities instead of large focus on the product itself. - B, C, D, E, F • Administration increases in its complexity and becomes more crucial to fully function since de-/recognize the revenue and correct invoicing are crucial. - B, C, D, E, F • Risk management becomes more vital including to mitigate misuse from customers and stakeholders, failure in products and input/output delivery, financial risk in terms of payments and currency fluctuations as well as contract violation. - B, C, D, E, F • Quality management of processes and products becomes central to IRMs, since downtime of the processes and products have a more direct affection on the organizations financials. - D, E • Cross-functional activities become more crucial, there has to be a better integration among the activities. - D (A, C, E mentioned it as resource) • Sales activities changes to have more focus on value offered than the product itself - B, E, Experts • Design products with modularity and functionality. - A, C, F • Financial activities to fund the IRM. - C (Mentioned by others in resources)
	<ul style="list-style-type: none"> • Financial resources in terms of funding the RM. - A, B, C, D, E, F, Experts • IT systems to support the activities as monitoring, contract management and lower

Key Resources	<p>the administrative burden. - A, B, C, D, E, F, Experts</p> <ul style="list-style-type: none"> • Data analytics to support activities as predictive maintenance and risk management. - A, B, D, Experts • Stakeholder knowledge becomes more crucial since the business exchange requires continuous delivery and extended relationship with collaborators. - A, E, F • Cost and price knowledge increases in its importance due to its impact of longer contracts with the customer. - A, B, C, F, Experts • Legal knowledge increases in its requirement due to a more complex RM and longer interaction with customers. - A, D, F • Product knowledge of quality and operability over its lifetime becomes required, since the company no longer benefit from downtime. - A, C, E, F, Experts • Cross-functional knowledge to allow for integration of solutions, which requires a non-silo thinking corporate culture. - A, C, E • New types of human resources mainly in terms of selling and communicating the IRM, but also to ensure the activities and that the right knowledge exists. - A, B, D, E • Business owner is required to act as a “champion” for each business case and to ensure that contractual, legal and cost aspects stays within the acceptable margins. - C, E, F • Ensuring availability of spare parts and complete products becomes crucial. - C, E, F
Key Partners	<ul style="list-style-type: none"> • Partnerships as dealers and suppliers become more crucial and the key partners depend on the business setting, but new key partners as financial, legal and insurance companies may emerge. - A, B, C, D, E, F, Experts • Partnerships are especially crucial for some companies that cannot offer an IRM due to legal restrictions otherwise, however this would affect TRMs in form of leasing and rental as well. - A • Customers are considered as crucial partners. - C, E, F, Experts
<u>How value is transferred</u>	
Customer Segments	<ul style="list-style-type: none"> • The target group will become more niched due to uncertainty factors, hence requirement of correct segmentation increases. - A, B, C, D, E, F, Experts • Potential to attract new target customers, but it depends on the risk involved of whom that is appropriate. - A, B, C, D, E, F, Experts • Potential to attract new customer segment. - E, F
Customer Relationship	<ul style="list-style-type: none"> • Increased need of understanding and collaborating with customers to increase value for both side and lower risk for the supplier. - A, B, C, D, E, F, Experts • Customers are considered as a partner. - A, B, D, E, F • The relationship process needs to start earlier. - C, Experts
Distribution channels	<ul style="list-style-type: none"> • Increased need of better communication channels. - A, B, C, D, E, F, Experts • More efficient distribution channels as logistical system. - A, B, C, E, F, Experts • Sales process and managing channels becomes vertically integrated due to the complexity. - A, B, C, D, E, F, Experts
<u>How revenue is captured</u>	
Revenue Streams	<ul style="list-style-type: none"> • No upfront payment. - A, C, D, E, F • Recurring payments over longer time period. - A, C, D, E, F • Potential to increase revenue streams due to the premium for taking a higher risk. - A, B, C, D, E, F • Risk of reducing revenue streams. - A, D, C, E, F • Some previous revenue streams transform to costs, such as spare parts consumption. - A, C, F • The revenue streams become uncertain to higher degree. - A, C, D, E, F

	<ul style="list-style-type: none"> • Pricing becomes more complex. - B, C, E
Cost Structure	<ul style="list-style-type: none"> • Potentially increased costs for supporting new activities. - A, B, C, D, E, F • Increased cost exposure due to higher risk. - A, C, D, E, F • The costs are becoming more uncertain than before. - A, B, C, D, E • The cost focus shifts from being more central to production activities to focus on activities supporting the RM, e.g. funding the IRM. - A, C, D, E, F • Need of spare parts becomes a cost instead of a revenue. - A, B, C, F • Decrease in costs related to warranty. - A, C, E, F, Experts

Table 4.1. Summary of IRMs influence on the BM components according to empirical findings.

Summary of components mentioned as the most important.	
Value Proposition	A3, A4, B1, B2, B4, C1, C2, D1, D2, D3, D4, E1, E4, F1, F2, F3, F4, Exp2, Exp3, Exp4
Cost Structure	A2, B2, B3, C2, C3, D1, D3, E3, F3, F4, Exp2
Revenue Streams	A1, A2, C1, C2, C3, D1, D3, E3, F4
Key activities	A1, A3, A4, D2, E2, Exp4
Customer Relationships	A2, A3, Exp2, Exp3
Resources	C4

Table 4.2. Summary of components mentioned as the most important.

Summary of components mentioned as the least important.	
Customer Segment	A1, A2, A3, B3, C2, D1, D4, E2, F1, F3, Exp4
Key Partners	A1, B1, C1, C4, D3, E1, E4, F2, Exp2, Exp4
Customer relationship	B2, C3, E4
Cost structure	A1, A4
Distribution Channels	F4, Exp3
Key Activities	D3
Key Resources	D2

Table 4.3. Summary of components mentioned as the least important.

5. ANALYSIS

This chapter presents the analysis based on the gathered empirical data together with the previously given theoretical framework. The chapter follows the structure of the business model canvas.

5.1 ANALYSIS OF HOW THE DIFFERENT COMPONENTS ARE INFLUENCED

5.1.1 VALUE PROPOSITION

How the value proposition becomes influenced by IRMs is limited among the existing academic papers, where mainly a few papers touch upon this with a limited scope. Gebauer et al. (2017a) explain that the value proposition is likely to become considered as a solution instead of a product, whereas Bonnemeier et al (2010) use other words in form of an input/output focus. All the case companies and the experts seem to agree with this picture, which can be exemplified from company A's expression *"The value proposition will be changed from having a more product-oriented focus to focus more on a solution offering, hence offering something that creates value in terms of the customers' BM"*. Ng et al. (2013) together with Gebauer et al. (2017a) and Visnjic et al. (2017) underline that IRMs enable the customer to focus more on its core activities due to the reduced risk factor, which is confirmed by company A, D, F and the Experts. Company E express this phenomenon in terms of offering an insurance *"We offer an insurance of reliability and performance that include the product with an adapted payment plan for the customer business"*, whereas B and C use the words "peace of mind". *"The customer appreciates to have a peace of mind and to know the cost of the service in advance and that they are connected to his own operations"* - company C. Additionally, company D, E, and F take this further and explain that the customer acquires the benefit from easier being able to predict his costs of operation, which is something that the existing literature does not mention. However, Gebauer et al. (2017a) and Visnjic et al. (2017) argue that there will be an alignment of incentives between the supplier and customer, since the manufacturing firm no longer has incentives of selling more spare parts or deliver these in an inefficient way, since uptime becomes crucial for both parties.

Company A, C, E, and F confirms the alignment of objectives and argue that this is likely to increase the perceived value by the customer. The Experts suggest that the interaction between the supplier and customer increases as well as it is in the suppliers' interest to ensure that uptime is upheld. Neither company B or D touch upon this aspect, but mention similar things as *"Uptime is valued by the customer and therefore we can improve our value proposition"* - Company B, which could be interpreted as they agree with the other companies. Another aspect that the academic papers not raises is the benefits for the customer of avoiding the accounting regulations of IFRS16, which start to be valid from 2019 and implies that the lessee needs to put the asset value on their balance sheets for rental, financial and operational leasing. By offering a PSS through an IRM the customers do not need to follow these rules which is a benefit several customers value. *"Our customers are willing to pay a high premium to avoid lifting the assets in their balance sheet"* -

company C. The findings from the literature review can be considered as approved by the empirics. Additionally, the aspects of IFRS16 that were found through the case study were not mentioned in any of the academic papers. The believed perception of the case companies that have not yet implemented an IRM was supported by one or more of the experienced case companies.

Main Influence on Value Proposition

The value delivery becomes adapted to the BM of the customer, by offering a solution with an RM connected to the input or output of the customer.

The value for the customer is to acquire a peace of mind by transferring more of the risk to the supplier as an insurance. This enables the customer to put additional focus on his own activities and does not need to worry about functionalities related to the product.

The customer experiences additional value from knowing that the supplier does everything in his power to ensure usability and performance. They both share the same objective, and the supplier no longer has incentives to make additional money with from downtime that affect the operation of the customer.

The customer is able to better predict his costs of operation due to having a fixed cost per usage hour or by a performance measure.

Additional benefits for the customer are possible to increase. One of these aspects is the benefit of avoiding the IFRS16 regulation concerning balance sheet affection. With an IRM, the customer does not need to lift the asset on the balance sheet as is required with TRMs.

5.1.2 KEY ACTIVITIES

The shift in value proposition is likely to increase the importance of activities focusing around problem-solving instead of production (Osterwalder and Pigneur, 2010; Ng et al., 2013; Gebauer et al., 2017a), which is confirmed by company E and F, who currently offers diverse IRMs. Company F exemplifies the aspect *“The focus in our activities switch to problem-solving, which requires activities as system and platform integration”*. The other companies and experts did not speak in terms of problem-solving but mentioned that the activities need to support the value proposition. Hence, it can be interpreted as problem-solving activities since they suggested the value proposition to focus more on complete solutions and problem-solving. Several authors, including Anderson et al. (2006), Reim et al. (2015) and Böhm et al. (2016), suggest that the interaction with customer needs to become relational activities, and Bonnemeier et al. (2010) and Töytäri and Rajala (2015) highlight the crucialness of performing activities to understand the customer and to acquire data. The collaboration activities are mentioned by company A, C, E and highlighted by the Experts *“People that are working towards the customer will have to work on closer relationships as collaboration increases with an IRM compared to a TRM”*. However, company B, D, and F mentioned an increased need for collaborating when referring to the component *Customer Relationships*. A main reason why it is important to work closer with the customers, according to the respondents and the literature review, is to enhance the acquisition of information and by leveraging the knowledge, the contracts becomes less risky for the supplier. Reim et al. (2015) speak about contract management, monitoring and predictive analytics as central activities. These

aspects are confirmed by all the case companies and experts, where company E explained *“We need to work closely with contract management and also really know who our customers are. Predictive maintenance and monitoring of our products increase in its importance to lower the involved risk”* and connects this back to the customer relationship and understanding. Furthermore, company A emphasized their need of acquiring these activities to enable IRMs *“Moreover, predictive analytics and data management is crucial to both follow up and predict our costs which are activities we currently lack”*. Company A, C, D, E, F elaborated around the risk mitigation activities further in terms of monitoring, which is necessary to mitigate misuse from the operator as well as misuse from external service dealers. *“Since we have an external dealer network, and we pay for every working hour and spare part, the dealer has incentives to replace more parts than necessary if we do not share any risk with them”* - Company C. *“Monitoring enables us to examine the usage behavior of the operator, which results in that several of cases we acquire a compensation from the customer for not following the contract terms instead of facing cost of repairing the engines when the underlying factor of the breakdown is misuse”* - Company F.

Additional activities central to contract management are cost management and pricing highlighted by all the respondents, which also is a central theme around the academic authors as well. Sawhney (2006) and Reim et al. (2015) further underline the importance of working with legal aspects, which becomes confirmed by company A and F. However, the other case companies talk about legal aspects as a resource to support required activities. Central from the discussion in the literature review and among the respondents is to complement the activities supporting the value proposition with activities to lower the risk for the supplying organization. The influences raised in the literature review were confirmed by the majority of the respondents, but the literature review did not mention some activities, which the case companies considered as crucial including; new types of sales activities, having more cross-functional activities, and activities that support an easiness of administration. *“One of the most required activities was to ensure elimination of silos by having cross-functional activities, since there is a higher requirement of internal efficiency”* - Company C. Company D added *“Too high administrative burden was one of the reasons to why our IRM for maintenance and repair contracts once failed. Automation of administrative activities is crucial”*.

Reim et al. (2015) highlighted the need of adapting the product design to become more modular to ensure functionality and uncomplicated maintenance, which was confirmed by company A, C and F. *“Modular and simple product design create benefits with IRMs when offering uptime, which was considered negative when selling upfront, since complex service schedule and requirement of replacing functioning parts boosted our aftermarket sales”* - Company F.

As illustrated by the discussion there are several activities required to support IRMs. The literature review managed to grasp some of these aspects but the underlying factor was not highly motivated as in the empirical findings. Most of the activities many manufacturing firms did already possess, which makes it harder to distinguish between which activities that are crucial for IRMs compared to TRMs. Company F exemplifies this *“Since the company had been offering service contracts for long, they already have activities as connectivity and monitoring to enable this in a sufficient way”*.

However, even if several of the crucial activities were possessed by several of the case companies, there is potential that these activities might new to some firms. Company A highlighted this aspect and pointed out predictive analytics and data management. The most significant change in activities could potentially be the shift in what they shall support, from a production focus to solution focus, which increases the scope and complexity. As highlighted by company D “*Activities will become more continuous than before, since we are no longer delivering in a single point of time*”. The activities thereby need to be cross-functional to facilitate an increased flexibility to support the complexity. The activities can be seen as becoming more interconnected with each other. Additionally, the activities tend to focus more on supporting the contract and value offering itself than on production related activities, which can be exemplified by company F “*Before the cost management was more related to production activities, today I would say that there is a greater emphasis on the costs over the contract time*”. In general, the experienced case companies confirmed the believed picture among the inexperienced case companies.

Main Influence on Key Activities

The activities shall support not only the production process and the value proposition in terms of a one-time delivery. The activities need to become more continuous and support problem-solving.

The activities become more interconnected with each other due to the complexity, hence they need to be cross-functional and agile to support the value proposition and RM. Additionally, efficient ways of how to exchange information among activities, departments, and stakeholders need to be improved, otherwise, it will become a total administrative burden which potentially fails the IRM.

A common denominator for the majority of the activities is that their purpose is to decrease the risk for the supplying organization.

Activities that become novel to firms when transferring from TRMs to IRMs are likely to be company specific. However, the following activities are considered as necessary for IRMs: Monitoring, Predictive Maintenance, Cost Management, Pricing, Contract Management, Customer understanding, Risk management, Quality management, Adapted sales activities.

5.1.3 KEY RESOURCES

The academic literature considering how key resources are influenced by IRMs is very vague and is only briefly mentioned by Ng et al. (2013), Reim et al. (2015), and Gebauer et al. (2017a). The resources they mentioned are knowledge in different forms, IT systems and funding resources, which can be related back to the key activities. Considering the case companies and experts, their answers are likewise dependent on the activities presented in 5.1.4. For example, company E suggested “*Resources and activities are for me very related, resources shall support and enable us to do the right activities. Of course, we need to have resources that enable us to do correct risk analysis, manage the contract terms, and to find the right partners*”. Additionally, the interconnectedness between resources and activities is addressed by Osterwalder (2004) and Johnson et al. (2008). The aspect of interconnectedness among key resources and key activities, as well as the dependency on activities makes the analysis of how the key resources are influenced complex. For example, during the interviews, the most of the respondents struggled to concretize

resources, which could be a reason of why other BM frameworks merge resources and activities into an infrastructure (Schaltegger et al., 2011) or a value chain (Chesbrough, 2008; Gassman et al., 2012). However, the key resources mentioned in the literature are addressed by all the case companies and experts, hence they can be considered as confirmed. As in the case of key activities, the literature review provides the reader with a vague guidance of why these resources are necessary compared to the empirical findings, which provide a better explanatory view.

All the companies, except B and D, addressed product knowledge as a key resource to make IRMs manageable, since even though if the value proposition change, the underlying factor is still the product. In order for the supplier to offer uptime, performance or value, they need to deeply know the outer boundaries of the products performance in terms of quality and workload efficiency, hence extensive product knowledge according to company A, C, E, F, and Experts. Company C and D highlighted the need for cross-functional activities but from the aspect of resources. Company A, C, D and E argues that cross-functional knowledge is necessary, but requires an appropriate corporate culture. Meier (2013) highlighted this impact on PSS in their paper, but not from the perspective of IRMs. Moreover, company A, B, D, and E suggest that new types of human resources are vital to ensure appropriate selling and communication, but also to ensure that sufficient knowledge exists. *“The need for appropriate human capital in terms of employees that can guide the customer through the solution and adapt the offer after the customer needs becomes more crucial due to the complexity of estimating the business case. Hence, these need to be acquired or developed”* - Company D. However, all the companies and experts mention this aspect when they speak about distribution channels, which can be referred back to as required resources to enable those channels.

The companies who currently are offering IRMs, C, E, and F, were more specific regarding human resources and found a business case owner crucial for each of the contracts, to ensure that the required activities become accomplished. The aspect can be exemplified with company C’s statement *“New resources as people with the right competence to ensure that the right activities become performed, as for example a Business Owner for each case that ensures the contract terms are fulfilled and act to keep the cost over time within budget”*. Another aspect that was central to C, E, and F, was the aspect of having appropriate resources of spare parts and complete products, to quickly be able to repair or switch the whole product if major breakdowns would occur. When using a TRM, they did not find the same requirement of having warehouses of spare parts in case of something would happen or complete products to replace existing ones. *“We are required to have resources in terms of hubs with spare parts, appropriate logistical systems and complete engines on the shelf in case of major failures. This is a resources that is costly, but necessary to avoid large penalties due to not delivering what promised”* - Company F. However, company C has solved the issue with having complete products on the shelf by operating with different rental companies, and the products company E uses are rental machinery they rent from their parent company.

As in the case with key activities, it might be hard to say exactly which resources are required for IRMs compared to TRMs, which was suggested by the majority of the respondents and extra highlighted by company E and F. This since several of the companies already has most of the

required resources, but they might not be used on the same level. For example, the literature review highlights the need of funding, and Gebauer et al. (2017a) suggest this as one of the most crucial aspects since without funding the RM will not be applicable due to cash flow affection. All the case companies and the experts confirm the need for funding, but most of them already work with funding in terms of financing the sales by providing longer credits or financial payments. However, the change will be that the companies need to internally fund their own RM in order to make this work, which will affect their balance sheet since the value of the assets needs to be mirrored. Company E further suggests that the complexity within the resources and their interdependence increases, and additionally highlights the main influence for IRMs *“The main difference between TRMs and IRMs is found in the importance of supporting the activities to a higher degree which requires cross-functional capabilities and knowledge”*. Additionally, the majority of the respondents highlighted that the need of supporting the key activities become more vital for IRMs due to the associated risk and potential of penalties. In order to mitigate the risk legal knowledge is highlighted as a key resources among the companies, and Company C, E, and F explains that their contracts have specific definitions of the terms, e.g. lowest amount of usage, in order to mitigate the risk and to acquire contacts that are manageable. Thereby, it is unlikely for manufacturing firms that offers PSS to offer IRMs with fully flexible contracts regarding usage, which can be the case for firms offering software or TV subscriptions with pay-per-use contracts. Additionally, Company C and D highlighted the need of having legal approval in term of certificates or permission in order to sell IRMs in some countries, since IRMs can be viewed as a financial service.

Main Influence on Key Resources

Due to the complexity and risk associated with the IRMs, there is a higher importance to support the key activities to avoid additional costs associated with failure of delivering the value proposition, e.g. penalties.

The literature review highlighted the most of the required resources but did not mention the need for new Human Resources, Product and Cross-functional knowledge. Once again, this might be resources that the company already possessed when offering a TRM, hence the novelty among key resources becomes company specific.

Key Resources considered as necessary for IRMs are:

Financial resources to fund the revenue model.

IT systems and Data Analytics to support activities of monitoring and contract management. Knowledge of Stakeholders, Contracts, Legal, Customer, Cost, Price, Product and Cross-functional

Human Resources in terms of more explicit knowledge about e.g. Sales process, cash flow affection, contract, legal etc., and a Business Owner for each contract.

Warehouses/hubs/logistics or other ways to ensure efficient use of spare parts and replacing products

5.1.4 KEY PARTNERS

All the Case companies and Experts addressed the increased need of relationship and working appropriately with partners to ensure that the value proposition is delivered as promised, which also was suggested by Reim et al (2015), Gebauer et al. (2017a) and Visnjic et al. (2017). The reason

behind this, according to the literature review, is due to the complexity of the IRMs, and that the supplier becomes negatively affected by the associated penalties, which was confirmed by the respondents. However, the aspect of how partnerships will change more than becoming more crucial was not expressed in a unified picture among the case companies.

Company E and company F considered that the complexity of the IRMs make partnerships, e.g. with external dealers, in some cases inappropriate due to lack of the knowledge or expertise, whereas in the case of company C they are dependent on their external dealers which is why they find partnership crucial. Company D also expressed an opinion of having a more in-house sales process by using their fully owned and not private dealers due to the complexity of the IRMs “*I don't think that we will have the same partners in the sales process, I think that we mainly will use our fully owned dealer due to the complexity of colliding incentives and lack of control*”. However, the difference could potentially be explained by that company C do not have any fully owned dealer network or similar to manage this fully in-house compared to company D, E, and F, and thereby find external partners crucial. Company A supported this consideration by underlining that they are dependent on partnerships with their OEMs in order to enable IRMs due to legal restrictions of ownership right when an engine becomes integrated in e.g. a machine. However, they emphasized that they would have the same need for enabling leasing or rental. Company F, who also manufacture engines did not face the same problem of ownership since there is a specific regulation for the aerospace industry. How companies choose to work with partners or not, do not seem to be central to IRMs, instead it seems to be rooted in the culture and risk aversion of the companies, since companies offering TRMs need to choose if they want to be vertically integrated or not.

Most of the case companies did not see a necessity to work with new partners. “*In our case, I don't see such a difference in key partners more than that those who were key before, become even more important, and before this offering we still had to work with financial and insurance institutions, our dealer network, and suppliers*” - Company C. However, company A highlighted the need for them of working with new partners “*We need to partner up with financial, legal and insurance companies to enable IRMs, but this might be specific for us*”. Gebauer et al. (2017a) suggested that partnerships with banks and legal institutions only is crucial when not having this capability. Thereby, the requirement of new partners seems to be company specific, as the other companies already using financial, insurance, and legal partners did not express a need for new partners. The companies C, E, F and The Experts highlighted that the customer becomes considered as a key partner compared to before, even if they all work closely with their customers. Even if company C did not see such a change in their key partners, they highlighted the need of working with legal partners to acquire the right knowledge and insurance partners to mitigate the risk of larger breakdowns of their machineries, since they do not have a large portfolio enough to manage the risk in-house.

Main Influence on Key Partners

The importance of existing partners is likely to increase with IRMs due to the complexity and the risk involved in the supplying organization. Customers are likely to be considered more in terms of partners instead of just customers, due to the long interaction and risk involved.

The internecine ranking of the partners is tough to distinguish since the choice of partners seems to be firm specific and related to decisions that not concern the IRM itself. For example, one of the companies required new partners in terms of finance, legal and insurance companies, whereas other companies already had this partnership before implementing an IRM. Some companies saw their external dealers as crucial partners whereas other companies wanted to solve that process in-house with fully owned dealers to simplify to processes and mitigate colliding incentives.

The precise need of partners is company specific, but partners discussed and mention by the literature review, the case companies, and experts were: Insurance, Financial and Legal institutions, Suppliers, Dealers, and Customers.

5.1.5 CUSTOMER SEGMENTS

The literature is vague considering how the customer segments are influenced, Gebauer et al. (2017a) suggest that correct customer segmentation is crucial to reduce the supplier's risk. This is confirmed by all the case companies and experts, where company E explains *"We do not offer this to whomever, there need to be a substance and a match between what kind of risks that are involved with the specific customer"* which is further highlighted by company B *"They most of our existing customer would be interested in an IRM, but there has to be a match between the acceptance in financial risk and premium charged"*. Additionally, Töytäri and Rajala (2015) argue that correct segmentation enables maximization of the customer value, which thereby can be viewed as a way to enhance the value proposition. Company E confirms this with *"Selling to the wrong type of customer or segment can be devastating but finding the right one enables us to maximize value for us and the customer, hence a rigorous analysis is required before any contract can be signed"*.

There seems to be a general opinion that the customer segments become more niched than before, hence the target audience decreases due to the risk of the customer, which is highlighted in the discussion above. However, company A, B, D, F and Experts argue that no new customer segments will arise but potentially new customers within existing segments, whereas company C and E sees an opportunity *"In the future I believe with maturity our offering will be more applicable for other types of customer within existing segments or maybe even new segments"* - company C. The diverse picture considering customer segmentation could be explained by that company C and E do not currently sell to every type of customer that potentially could have a use for their product, compared to company A, who has a very broad spectrum where their customer segmentation is based from a product-oriented view in terms of how the product shall be used more than characteristics of the customer. Thereby, it is hard to state from the empirical findings if new customer segments will occur or not due to the ambiguity of customer segmentation. Furthermore, Gassmann et al. (2013) consider customer segments to describe *"who the customers are"* which is from a customer

perspective, whereas Osterwalder and Pigneur (2010) state that segmentation can be made in several ways, as for example based on the perspective of the product or service.

Even if IRMs might not be applicable for all existing customers due to risks, there is a belief among company C and D that with maturity the risks will decrease and then an increased customer base can experience the offering. Company F confirms their belief by stating that their customer base has increased with maturity. The majority of the respondents do not see a problem in the desire within their markets, more with the issues of limiting the risk factor.

Main Influence on Customer Segments

As highlighted by both the literature review and the empirical findings, the customer segmentation increases in importance due to the increased risk for the supplier. Correct segmentation based on maximizing value for the customer, as suggested by Töytäri and Rajala (2015), does not seem to be central for only IRMs, more for every type of RM.

The offering seems to be niched in the beginning but has a potential to be offered to a larger customer base with maturity, but it all depends on the risk involved. Considering the aspect of generating new customer segments, there seem to be different methods of how firms segment their customers, so thereby will the answer be different for each company.

Customer segmentation from the products view, tend to be the same as before, hence trying to sell to as many as possible that has a desire for the product, or in this case PSS. However, the requirements on each customer increase with the risk, hence the customer segmentation can be considered as becoming more complex in nature.

5.1.6 CUSTOMER RELATIONSHIPS

Viewing the customers as partners was already raised among the majority of the respondents in the component of key partners, and this view was even stronger when the respondents were asked how the customer relationships would change. All the case companies and experts suggested that the customers become more as partners, exemplified by company D *“The customer relationship becomes crucial, and the relation is more as a partnership”*. Gebauer et al. (2017a) argue that closer relationship with the customer is essential for IRMs due to the increased complexity and that the relationship creates benefits for both sides of the contract. The aspect of creating win-win situations was central for company A and C, *“If we are able to understand our customers better we will be able to provide them with better contractual conditions by lowering the involved risk, it becomes a win-win situation”* - Company A. The other case companies and experts did express themselves more in lowering their own risk and at the same time maximize the value for their customers, exemplified by company B *“We need to learn their business to provide the maximum value delivered and to lower our risk”*. Ng et al. (2013) and Töytäri and Rajala (2015) highlighted the aspect of maximizing value delivery, and Reim et al. (2015) and Böhm et al. (2016) underlined the aspect of lowering the risk involved with a better understanding. Company A went even further in the value delivery aspect by suggesting the potential to add value to potential gaps a customer had in their BM, which was confirmed by company E stating that they have started to offer

combination of usage-based and performance-based contracts due to a better understanding which enables even more value for the customers.

The Experts and company C suggested that the collaboration need to start in an earlier phase compared to TRMs *“We need to work with the customer from an earlier phase, to be able to create a value proposition that is adapted to the customers’ needs. The process becomes change from finding customers adapting to our finished products to collaboratively create offerings adapted for the customers”* - Company C. However, company E argued that they already worked tightly with their customers before by offering tailor-made business cases. How much the customer relationship will change when switching from TRMs to IRMs is thereby hard to tell.

Main Influence on Customer Relationships

Central to all respondents and the literature is that customer relations will intensify. According to all case companies they view the customer more as a partner, to generate the required understanding. Hence, the main influence is that relationships increase in their importance.

*The underlying factor of closer collaboration seems to be lowering of risk and possibility to create higher value for the customer, exemplified by company B *“We do not want to enter a contract based on an IRM with a customer we cannot trust or do not know how he operates”*.*

How much the customer relationships will change will be dependent on the specific company, the same as in what phase it is necessary to start the collaboration. For companies working already close with tailor-made business cases the influence will be lower, compared to firms only selling their product without any more interaction.

5.1.7 DISTRIBUTION CHANNELS

The literature about distribution channels is very vague and nonspecific. Central among Ng et al. (2013), Töytäri and Rajala (2015), and Gebauer et al. (2017a) is the need of having appropriate channels to transfer the experience, which is more crucial for IRMs, and to monitor the input or output. That the channels increase in their importance and the need for correct ways of monitoring is confirmed by all the case companies and experts. However, all the respondents find better communication to mediate the understanding of the complex contract as an underlying reason, exemplified by company C *“The communication process needs to be improved, we need to mediate an understanding and creating a need even if the costs when the customer adds them up may increase the costs he paid before”*, and company E *“The different phases in the communication, need to be deeper explained and analyzed, since the complexity of this contract type increases”*.

The complexity of IRMs with requirements of uptime and performance puts additional requirements on distribution channels to ensure an efficient flow of spare parts according to company A, B, C, E, F, and the Experts. *“To distribute spare parts effectively becomes much more crucial due to the affection of usability and performance”* - Company B. Company D does not put any emphasis on the spare parts distribution which could be explained by their worldwide internal dealer network and logistic systems, which are required for their service contract offering. However, company D

further suggests that the channels for information flow have to be changed into a completely digital to facilitate 24/7 monitoring without increasing the administrative workload too much. The reason for why company D put extra emphasis on this aspect is likely dependent on their previous failure of implementing an IRM, due to the unmanageable administrative burden, which they highlighted in the section key activities.

The sales process is argued to increase in its complexity compared to the TRM according to all respondents, and company D believes that the sales process and interaction with customers need to be more vertically integrated “*External dealers do not have the time, possibility or the knowledge to manage this. We will have to do it centrally or at least at a higher level in-house or with actors that we really trust*”. Company B, E, F agrees with company D, whereas company A is dependent on their external dealer network and suggests more intense collaboration which is the way how company C has chosen to operate. “*The sales process need to facilitate a more financial mindset than technical sales, it is important that the customer understand the financial advantages and disadvantages since it is easy to misinterpret these complex contracts. We thereby need to take a more central role in the sales process to the end customer and cannot at the moment depend on our external dealers*”- Company C. The Experts highlighted an increased need of collaborating with the dealer network, but they do not make a difference among internal (company owned) and external dealers (not company owned). However, the IRMs are likely to increase the requirement on the dealer network, and it could be desired as an in-house activity to ensure channels of better quality and correct transfer of information. For companies that lack the benefit of having fully owned dealers (e.g. A and C), the complexity increases but can be managed in some cases, and once again it is all about the risk involved.

Main Influence on Distribution Channels

The literature is vague considering the influence on distribution channels. However, the increased importance of appropriate distribution channels is highlighted and confirmed by the case companies who explain the underlying factors in a more detailed view. Among the case companies, there is a view that the channels need to support the activity of acquiring a better understanding of the customer but also health and use of the product.

All respondents agree that the complexity requires a deeper engagement from the manufacturing firm. The companies with the presumption to perform this in-house prefer this due to the risk, whereas companies dependent on external actors need to be more scarce in their choice of external dealers to collaborate with.

The main influence on distribution channels is that they increase in their importance to mediate right information, ensure reception of data and delivery of spare parts. However, how much the distribution channels will change is dependent on the company.

5.1.8 REVENUE STREAMS

The monetary transactions will change from a large upfront payment to smaller recurring revenue streams according to Bonnemeier et al. (2010) and Gebauer et al. (2017a), which is the main message among the respondents as well. The academic papers further highlight that the risk is

transferred to the supplying company and hence is able to capture a premium for this in terms of increased revenues, which is confirmed by all the case companies, but they further highlight that the increased risk potentially may lower their revenues as well. *“We are able to capture an increased amount of revenue streams, but we also face the risk of lowering our revenues and increasing our costs if we do not deliver as promised”* - Company B. *“In the beginning we struggled to price the contract appropriately, and additionally faced some penalties. This resulted in lower revenue streams for some business cases, but with maturity the pricing has become more accurate and the number of penalties has decreased”* - Company E. That wrongly priced IRMs will have a higher negative impact on the revenue streams compared to TRMs, was further mentioned among company A, B, C, and D, whereas company F put more emphasis on explaining that not acquiring the revenue upfront will result in increased cost to discount revenue to the value of today, which was supported by company B. The Experts did not mention the pricing aspect or the impact the delayed revenue will have, but Bonnemeier et al. (2010) suggest that the pricing mechanism itself switch from cost of delivery to value for the customer. This switch was not mentioned by any of the respondents per se, except company E who highlighted the peace of mind aspect. However, there was an underlying mentality among the case companies and experts that the pricing can increase due to the value for the customer, but the costs need still to carefully be considered. However, company C explained that they were able to increase their revenues heavily due to the value of the customer for avoiding the IFRS16 regulation.

Another aspect in terms of pricing that was raised among A, C, and F, was the fact that consumption of spare parts no longer can be viewed as revenue, and hence the costs need to be incorporated in the price from start. *“We can no longer consider sales of spare parts as revenue for these type of RMs, it shall be considered as a cost, which is why the pricing becomes much more crucial”* - Company A. However, as they charge a price for guaranteeing functionality, the spare parts still have an impact on the revenue.

The increased revenue streams were confirmed by the companies who currently are offering an IRM, but company C highlighted that they currently have not been exposed of paying any penalties since they are still in the early phases of the contracts. Company E added that they couldn't state that their profitability had increased, but without the IRM they would have lost business cases to cheaper competitors and hence not acquired any revenue at all.

Central among all respondents was that the characteristics of the revenues go from being certain to become uncertain since they do not know exactly when and how much revenue they will receive. However, company C reduced the uncertainty by adding a “lowest level of usage” clause in their contract terms. The uncertainty will affect the business control and revenue recognition in a negative way, since the companies can no longer recognize the revenue immediately, instead they need to do it upon usage or performance delivery. This aspect was highlighted by company A, C, and F, but the last two underlined that the negative aspects will be mitigated to some degree by an increased portfolio. Company A was not sure if IRMs would be appreciated by their investors (shareholders), if not certain profitability could be ensured each financial period.

Exp2, whom had worked within the aerospace industry highlighted the fact that in the perspective of the aftermarket, there is a potential to acquire the revenue streams earlier since for example, the airlines start paying per hour for the maintenance and repair as soon as they are in the air. This aspect was not mentioned by the other case companies but could argue to be valid since the respondent refers to other companies as General Electric and Rolls-Royce.

Main Influence on Revenue Streams

The revenue streams will change in their characteristics and become more uncertain. Furthermore, they will become recurrent and smaller in their size, but their total size has a potential to increase due to higher value perceived by the customer and the high risk taken by the supplying organization. However, there is a possibility for decreased revenues as well, and lower profitability due to higher costs.

The revenue streams can be acquired earlier in the terms of maintenance and repair contract since the customer starts to pay for them as soon as they use their product.

Consumption of spare parts is no longer the same as increased revenue streams instead it becomes costs.

The change in revenue streams is likely to have a high impact on other activities to enable an appropriate level of profitability for certain periods, hence the accounting aspects will become affected in terms of revenue recognition need to be done with usage or performance delivery. This means that IRMs might not be able for companies requiring a stable financial result each year, if not the uncertainty is mitigated by having a lower usage clause or a large portfolio to achieve a satisfying level of return on the shareholders' investment each year.

5.1.9 COST STRUCTURE

The academic papers used in the literature do not touch upon the cost structure thoroughly, but Tuli et al. (2007), Reim et al. (2015), and Gebauer et al. (2017a) highlight that the cost structure itself becomes more uncertain. All the case companies and experts confirm this aspect, and company C expresses this as *“The add-on risk for organizations is well mirrored in the costs structure. Before we were able to estimate our costs based on production activities, currently our costs need to be re-estimated constantly due to fluctuating risks in each of the contracts and that the costs follow the whole contract period”*, and company E as *“We are no longer able to plan our costs in the same way due to the associated risk, which affects our budgeting work negatively and creates a more complex business control situation”*. Company B, D and F further underline that the cost of funding the RM becomes central, as illustrated by company D *“If we do not longer sell our products upfront our revenue recognition becomes negatively affected, which is an aspect crucial for our investors. We need to recognize the revenue during certain periods to provide a satisfying result for our shareholders”*. The cost of funding or ensuring appropriate financial numbers in certain periods it not something that is highlighted in the academic papers, but the need of funding was highlighted by Gebauer et al (2017a) as a key activity.

The literature review further mentions that the costs are likely to increase to mitigate the uncertainty in the RM, which is confirmed by all case companies and the experts. According to company B, C, F, the Experts, and Gebauer et al. (2017a), the RM becomes heavily dependent on IT-system to

ensure appropriate monitoring and administration, and it is considered as one of the resources that drives new costs. Company A, C, E, and F further argue that even if costs increase, there is potential to lower some of the costs and company A believe that this could be the cost of warranty claims *“There is a possibility to decrease costs for repair and breakdown, additionally for warranty when our engines experience more appropriate service. However, this might demand increased investments in product development”*, and company C adds *“With this RM our motives to decrease the costs for warranty becomes increased”*, and company E and F confirm that they have managed to decrease their costs for warranty issues. Company C, D, E and F further argue that there has been a shift of focus area for the costs, from being central to production activities to activities that support the RM. *“Our cost structure do no longer mainly relate to production activities, currently it is more related to activities that support our RM as; IT system, administration, risk management and spare parts”* - Company C. This was not mentioned by company A or B, which could be explained by the fact that it can be hard to appreciate exact allocation of costs for something they currently do not offer. Furthermore, as highlighted by the case companies and the experts considering revenue streams, they once again highlighted that consumption of spare parts becomes something negative since it creates costs and not revenue as before.

Main Influence on Cost Structure

The main change in the cost structure is found in the change of underlying risk and uncertainty. For IRMs, the main costs are related to enabling the RM and supporting the offer compared to TRMs where the costs are mainly product and process related. The costs are likely to increase due to the need of key activities, and costs for investment in IT-systems and cost of funding the RM are considered as central and novel costs for IRMs.

Costs of ensuring that the revenue becomes recognized in the right period were mentioned repeatedly among the case companies, but something the literature did not mention. The cost structure seems to be affecting companies differently depending on 1. Requirement of profitability per financial period 2. The size of the portfolio, since a large population might mitigate the need for recognizing the revenue.

IRMs have potential to decrease some of the costs central for TRMs, one example that was mentioned among the respondents was the cost of warranty claims. This cost is likely to decrease since maintenance and repair of the product will be performed accurately, and the manufacturing company have incentives to ensure application of higher quality components to functionality.

5.1.10 DEGREE OF INFLUENCE

The degree of influence different BM components will have seems to be hard to measure since several case companies have respondents answering differently, which is why the empirical findings have been presented on an individual level. A central theme among the respondents is that they often answer more than one component as being the most important. *“I see the biggest change in the revenue streams and costs structure which is of course affected by the changes in the value proposition”* - D3. *“I do not see such a change in our distribution channels more than we have increased our capacity, but that relates more to the resources according to me. Additionally, I do not see such a change in customer segments.”* - F4. Another respondent considered the relationship

among the components be too complex to provide an appropriate answer “*My view of the BMC is that it is interconnected so I would rather say that it is changing the order of the components by switching RM*” - Exp 1. The interdependence is likewise highlighted in the academic papers by Amit and Zott (2011) and Foss and Saebi (2015), who argue that the disagreement about different components structure is due to the complex interdependencies. Other respondents further illustrate the independencies, “*Every component will become affected, but it all starts within the value proposition*” - D4, and some have a problem to accurately state the difference in influence among several components categorized as the most important. “*It is probably cost structure and revenue streams that are turned backwards. Customer relationships become more important. Value proposition changes.*” - Exp 2.

When freezing the setting and just counting the numbers each component is mentioned as the most important, see table 4.2, then the value proposition is the most important one, followed by the cost structure and the revenue streams. If only considering the answers from respondents belonging to the case companies who actually have implemented some kind of IRM (company C, E, and F), then the picture on the company level would suggest the same finding. However, the result among the respondents of case company A suggest that the key activities will be the most influenced, but this can potentially be explained by that company A is in need of new activities to enable IRMs, which was highlighted in 5.1.2 Key Activities. This view is further supported by C3 who suggests “*For some companies, I think that the key activities will change the most, in our case I would say the way we work with our costs and revenues*”, and D1 “*The most of the required activities to enable the IRM, we already do as of today to some extent. Then I refer to activities as working with funding, insurance, contract in different forms. Thereby, I see that the most change is within the value proposition and how our costs structure and revenue streams*”. When excluding all the respondents that have mentioned more than one component, the value proposition would still be the most mentioned, but cost structure and revenue streams would decrease in their importance.

Based on the empirical findings from a respondent and company level, it is likely that the value proposition will change the most, followed by the revenue streams and cost structure. The literature about IRMs does not mention anything about the degree of influence, but Osterwalder and Pigneur (2010) suggest that the RM is closely related to the revenue streams and cost structure. Furthermore, Afuah (2004) and Zott et al. (2011) argue that the RM is closely related to the value proposition. Bonnemeier et al. (2010) list *1. suppliers value proposition 2. parameter for price setting 3. revenue model* as three of the four categories that will be influenced when switching from a TRM to an IRM. The first category is related to the value proposition and the two latter are related to the revenue streams and cost structure, which further support the empiric findings. The fourth category, *performance parameter*, can be interpreted as affecting all the components of the BM due to the interrelatedness, but the influence per se is likely to be dependent on company characteristics, e.g. if they already did possess the required resources or activities to support the performance parameter which is linked to the value proposition and hence to the RM. Thereby, the interpretation of the empirical findings can be argued as supported by the literature.

To define the least influenced components can only the empirical findings be discussed since previous academic papers lack this perspective. The least influenced components are customer segments followed by key partners when only reading the summary of the empirics as presented in table 4.3. Focusing on the answers from the companies who have implemented IRMs, it is further evident that customer segments and key partners tend to be the least important components. However, when considering the underlying factor of why key partners would be the least important, the answers tend to be subjectively biased since the main argument is that the companies already possess the required key partners and their collaboration will only intensify. This perspective is believed as true by A1 *“However, the influence on key partners may increase if the company have not worked closely with their partners before”* and D3 *“I see the least change in how we work with key partners and key activities since we already work tight we just need to intensify”*, which additionally is confirmed by respondent C1 *“the least influence component, in our case, I see in how we work with our key partners now compared to before, since we already worked closely with them but this picture may not be shared with other companies”* and F2 *“Key partners are affected the least according to me, at least in our case. But this can be highly company-specific if you have never worked with e.g. financial institution”*. Based on this discussion, the degree of influence on key partners tend to be company specific and cannot be suggested as the component with the least influence. However, the underlying factor of why customer segments is the least influenced component is based on the risk factor, of not wanting to offer this IRM to everyone. However, central among the respondents is that with maturity, the risk will decrease and the company is likely to sell to the same customers as before, which is highlighted by for example C2 *“I do not see such a change in our customer segmentation, compared to that we only offer our key partners at the moment which is an active choice we made”* and F1 *“In the beginning we became hindered to offer our IRM to all our existing customers, due to the involved risk, hence our customer segment was influenced. However, with maturity, we have managed to decrease risk and currently, we are able to offer the IRM to customers with similar characteristics as we sold to when selling upfront”*. The customer segments tend to represent the least influenced component, and value proposition, cost structure, and revenue streams the most. The other components degree of influence cannot be stated and seem to be based on the characteristics of the company prior to implementation of an IRM.

Degree of influence

Due to the interdependencies among the BM components, the degree of influence is hard to determine, which is highlighted among the respondents as well as in the literature review.

However, if determining the degree of influence based on the empirical findings, the value proposition, revenue streams, cost structure are the most influenced. The customer segments are argued to be the least influenced, and the degree of influence for the remaining ones are argued to be highly dependent on the company characteristics prior to implementation of an IRM.

6. CONCLUSION

In the final chapter, the conclusions of the study are presented followed by a deeper explanation of practical implications that IRMs create. Finally, theoretical contribution and suggestions for future research are given on the subject.

6.1 IRMs INFLUENCE ON THE BUSINESS MODEL COMPONENTS

This thesis investigates the influences implementation of Innovative Revenue Models (IRMs) induce on large global manufacturing firm's business models since several firms have struggled and failed with the implementation, e.g. Michelins' first efforts with the pay-per-kilometer concept, whereas the success of other firms, e.g. Rolls-Royce Power-by-the-hour concept, has been unable to be explained thoroughly. Previous research within the area is scarce and not connected in order to explain the influences IRMs impose to the business model components. To acquire data, necessary to explain the influences, the researchers have conducted a multiple case study of manufacturing firms operating in the engine, vehicle, and machinery industry, that have implemented an IRM or are striving to. Business models are complex to understand holistically, which is why the study has chosen to view the influences on a component level. The researchers are aware of the complexities with business models in terms of the interdependence among the business model components and argue that it is necessary to acquire the component perspective in order to facilitate a structure, which is why the components have been viewed in isolation to provide a general understanding. Hence, the overarching research question of this study is:

How are the Business Model components of large global manufacturing firms influenced when implementing an Innovative Revenue Model?

By isolating each of the components the study has managed to find influences that are able to provide ideas and signals of how the management of large global manufacturing firms shall evaluate the potential impact implementation of IRMs would impose. Several of the influences found were not explained by the current literature, and some aspects on key activities as appropriate management through business case owners and how to manage the distribution of spare parts and replacement product were only highlighted by the experienced case companies. Considering the influences on the components per se, the study has found that some influences are highly dependent on the company characteristics prior to the implementation of IRMs, for example, if the manufacturer already works closely with their customers and offer tailor-made solutions, work with predictive maintenance, and data analytics, they might already possess several of the required *key activities* for implementation of IRMs, which will result in a lower degree of influence on that specific component. Manufacturing firms that are vertically integrated as in the case of Company E and F, are likely to experience less influence in *key partners* and *distribution channels* since they already possess the main requirements of enabling IRMs in-house, whereas companies as A, B, C, and D who already work with tailor-made business models which require a deep customer understanding and collaboration are likely to experience less change in their *customer relationships*. However, the *value proposition*, *revenue streams*, and *cost structure* have been found as the most

influenced components of the business model independent on the characteristic of the company prior to implementation of IRMs due to the uncertainty in future revenues and costs, and the new direction of having incentives to ensure uptime and performance instead of downtime. This finding is further explained by the fact that these components are related to the revenue capturing process, and the value proposition itself is argued to be highly related to the revenue model according to the literature review.

The influence on the *customer segments* is suggested to have the least impact in general on manufacturing firms since with maturity the manufacturer would be able to offer IRMs to similar target group as with TRMs. The influence on the other components as; *key activities, key resources, key partners, customer relationship, and distribution channels*, are suggested to be company specific and is highly dependent on the characteristics of the company prior to implementation of IRMs. Thereby, the exact the degree of influence for these components cannot be generalized and need to be examined on the respective company due to the interdependence among the business model components.

To answer the research question of how the different components become influenced, table 6.1 has been constructed. As discussed above, the influences on the *value proposition, revenue streams, and cost structure* seems to be valid for manufacturing firms in general, whereas the influences on the other components tend to depend on the characteristics of the company prior to implementation and its ability to manage risk. The result is suggested to be valid for global manufacturing firms that share similar characteristics as the case companies and operates in the same industries. However, as always with influences, they are highly dependent on the specific situation, hence the firms per se, which is why the influences in table 6.1 shall be used as guidelines and need to be further elaborated at each manufacturing firm when evaluating the influences on their specific organization.

Conclusion of IRMs influence on the BM components	
What value is delivered	
<i>Value Proposition</i>	<ul style="list-style-type: none"> • A shift from product oriented to solution oriented. • Increased value for the customer since a reduction of risk, hence a peace of mind is achieved that enables the customer to focus more on its core capabilities. • The customer can predict costs and link those to his own business operations. • Alignment of objectives in terms of uptime and functionality of the products. • Avoidance of IFRS16 regulations.
How value is created	
<i>Key Activities</i>	<ul style="list-style-type: none"> • Requires increased efficiency among activities and cross-functionality. • Failure in one activity creates a larger negative impact on the firm. • Activities become more related to supporting the RM than pure production. • Products need to be adapted to the revenue model, by having a high modularity and increased functionality. • Administrative activities need to have a high degree of automation to not affect the customer negatively or to provide the supplier with a high administrative burden. • Required activities are considered as: <i>Monitoring, Predictive Maintenance, Cost & Price Management, Quality Management, Contract Management, Risk management, Customer Understanding & Relationship Management, Adapted sales activities.</i> • Crucial key activities are cost and contract management.

Key Resources	<ul style="list-style-type: none"> • Increased need to support key activities since penalties apply. • Increased need for funding the RM. • Appropriate IT-systems that enable administrative tasks including data analytics that requires a low degree of human interference. • Requires increased knowledge about stakeholders and customers. • Legal knowledge becomes crucial due to more complex contract management. • Product knowledge become extremely crucial. • Cross-functional knowledge is required to a higher degree. • New types of human resources, mainly salesman that not only focus on the technical aspects, need to talk in terms of cash flow affection. • A business owner is necessary for each business case to ensure contract, legal and costs aspects. Could be replaced by technological automation. • Availability of spare parts and complete products increases, e.g. spare parts hubs.
Key Partners	<ul style="list-style-type: none"> • More dependent on partners to ensure external activities, customer = partner. • Enhanced need to work with partners as Insurance, Financial and Legal institution. • Partnerships are necessary for some companies to enable the IRM offering, due to legal restrictions concerning the right of retention (ownership) in the case when components become integrated in a larger product.
<u>How value is transferred</u>	
Customer Segments	<ul style="list-style-type: none"> • The target customer group becomes niched, increased importance of selling to the right customer to lower risk, which could be mitigated with maturity. • Potential to attract new customers.
Customer Relationship	<ul style="list-style-type: none"> • Increased collaboration → Partnership. • Requires a more extensive understanding of the customers considering their own business and how they will use the products.
Distribution channels	<ul style="list-style-type: none"> • Digital channels to enable transfer of data to support monitoring is required. • Increased need for more transparent communication with the user. • If external dealers, the manufacturing company will become more involved in the process with the end customers to ensure appropriate distribution. • The sales process is likely to require vertical integration due to increased complexities if not appropriate partners exist. • Need to mitigate “over-repairing” when having external service dealers. • Requires more efficient distribution of spare parts, geographic scope becomes dependent on hubs and logistics, more risk to operate in a global market.
<u>How revenue is captured</u>	
Revenue Streams	<ul style="list-style-type: none"> • Upfront → Recurring, Increases in its risk due to uncertainties in payments. • Possibility to increase revenue streams and capture new ones through compensation upon usage, penalties, risk premiums, and avoidance of IFRS16. However, there is a likelihood for lower revenue streams if contract terms are not held. • The pricing mechanism become more complex.
Cost Structure	<ul style="list-style-type: none"> • The costs become more uncertain than before. • New costs are likely to arise due to the requirement of key activities and resources. • The costs will be more associated with supporting the RM than production. • Funding becomes a central cost for IRM. • Spare parts are considered as costs. • Discounting is applicable if the uncertainty is limited, but for those the cost of discounting the contract will still be higher compared to TRMs. • Potential to reduce costs, mainly warranty related.

Table 6.1. Conclusion of IRMs influence on the BM components.

6.2 PRACTICAL IMPLICATIONS WITH IRMS

The implementation of an IRM creates several influences on the different business model components and due to their interrelatedness, they create a complexity which results in several practical implications that need to be further highlighted. For example, IRMs creates an enhanced value proposition by enabling the customer to avoid the IFRS16 regulation, which is an accounting principle that erodes the leasing benefit of not needing to show the value of the asset on the balance sheet. The balance sheet affection will instead be at the manufacturing firm, which is why this has to be accepted by the management board since it will affect the financial KPIs of the firm. Additionally, the company needs to have the ability to fund the revenue model since revenues cannot be achieved upfront. As in the case of leasing or rental, the firm would face the same issue, but then they have the ability to discount the invoiced value to a fixed cost. For IRMs, the invoiced value can no longer be discounted if not specific terms as least-usage or fixed fees applies. The benefit of less risk for the customer becomes transferred to the manufacturer with uncertain revenue streams and costs put additional requirements of having cross-functional activities, resources, and partners to ensure a more agile organization. At the same time, the mindset of the manufacturer needs to accept that e.g. the need of spare parts is no longer a revenue which requires an adapted product design, and the complex business control situation and the inability to recognize revenue upfront. The complexity of the cost structure and the uncertainty in the revenue streams further complicates the pricing process, which makes product knowledge and cost awareness prerequisites to enable an IRM. Additionally, legal knowledge becomes crucial to manage potential disputes and to enable favorable terms of the contracts, so that the defined uptime, performance and value can be delivered by the manufacturer, otherwise, there is a high risk of entering unprofitable business cases. To further mitigate the risk, the terms of IRMs are likely to not be fully flexible, especially for usage-based contracts, which tend to have a least-usage clause or fixed fees, hence cannot be comparable to usage-based contracts for software or tv-subscriptions.

An IT-infrastructure to enable a correct monitoring will be beneficial when implementing an IRM. Additionally, it is crucial to have efficient administration since the uncertainty in the contracts is likely to cause situations unmanageable, which was found as the main issue why company D failed with their implementation of an IRM. To mitigate the uncertainty in the contracts it is important to work with predictable processes and have a business case owner, who acts as a champion and constantly review the contract to ensure profitability. However, manufacturer selling components as engines (except within the aerospace industry), are required to partner up with OEMs in order to provide the offering due to legal restriction of title to goods, whereas manufacturing firms in general face the issue of not being allowed to offer the IRM since it requires certificates or permission in some regions that view IRMs as a financial service. The practical implementation varies in the degree of importance, but general for all manufacturing firms is that the ability to fund the revenue model, product knowledge, cost awareness, contract management and efficient administration, which are considered as prerequisites to implement an IRM.

6.3 THEORETICAL IMPLICATIONS AND FUTURE RESEARCH PROPOSAL

This study has created an academic base by applying the BMC framework of how IRMs are likely to influence the business model components for large global manufacturing firms. The influences were partly generated from the literature review and later validated and more deeply explained through the multiple case study. The case study enabled to add new influences which the existing literature did not mention. Additionally, the study has concluded several prerequisites necessary to be met before implementation of IRM, which are argued by the researchers to be another step towards increasing the academic understanding of this topic.

As discussed under section Delimitation and Research Quality, the principles for external reliability cannot fully be met, and the findings tend only to be of relevance for comparable manufacturing firms and not to any specific industry. This creates a potential for future research to further validate and create a framework that achieves a higher degree of generalization ability which potentially can be adapted for specific industries. Furthermore, the study concluded that the influences on business model components as *key activities*, *key resources*, *key partners*, *customer relationships*, and *distribution channels*, are likely to be dependent on the company characteristics prior to implementation of an IRM, which opens up for more detailed research to find similarities among different company types, IRMs or industries.

Additionally, there is potential for future research to further elaborate with the practical implications as found in this study, for example, best ways of dealing with complexities of revenue recognition for IRMs or how to fund the IRMs in an appropriate way. As discussed in section 1.6 Delimitation, the researchers have considered the influence from the different IRMs to be the same, which is a simplification of reality. By having this study as a base, future research would be able to examine the main differences within the influences between the different IRMs, and further answering the question by using different business model components as those that have been used in this research to potentially find another perspective of the influences.

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8. APPENDIX

8.1 Interview Guide

How Innovative Revenue Models influence the components of the Business Model

Introduction: We are examining how an Innovative Revenue Model (Usage, Performance or Value Based) influence the components of the Business Model. With Revenue Model we consider how the company is generating revenue and with Business Model we consider how a company is creating and delivering value. Innovative Revenue Models are according to our definition when revenue is generated based on usage, performance or value created for the customer, in difference to traditional revenue models where revenue is generated through product sales, rent, leasing, or licensing.

1. Can you please tell us about your current revenue model?

Presenting the business model canvas.

2. Considering the implementation of an innovative revenue model, i.e. usage-, performance-, or value-based, how do you think each of the components become influenced in relation to a traditional revenue model where the products are sold upfront.

What value is created?

- Value Proposition

How is the value created?

- Key Partners
- Key Activities
- Key Resources

How is the value delivered?

- Distribution Channels
- Customers Segments
- Customer Relations

How is the revenues generated?

- Revenue Streams
- Cost Structure

3. Which components in the business model do you consider as being most influenced by the shift from a traditional revenue model to an innovative revenue model?

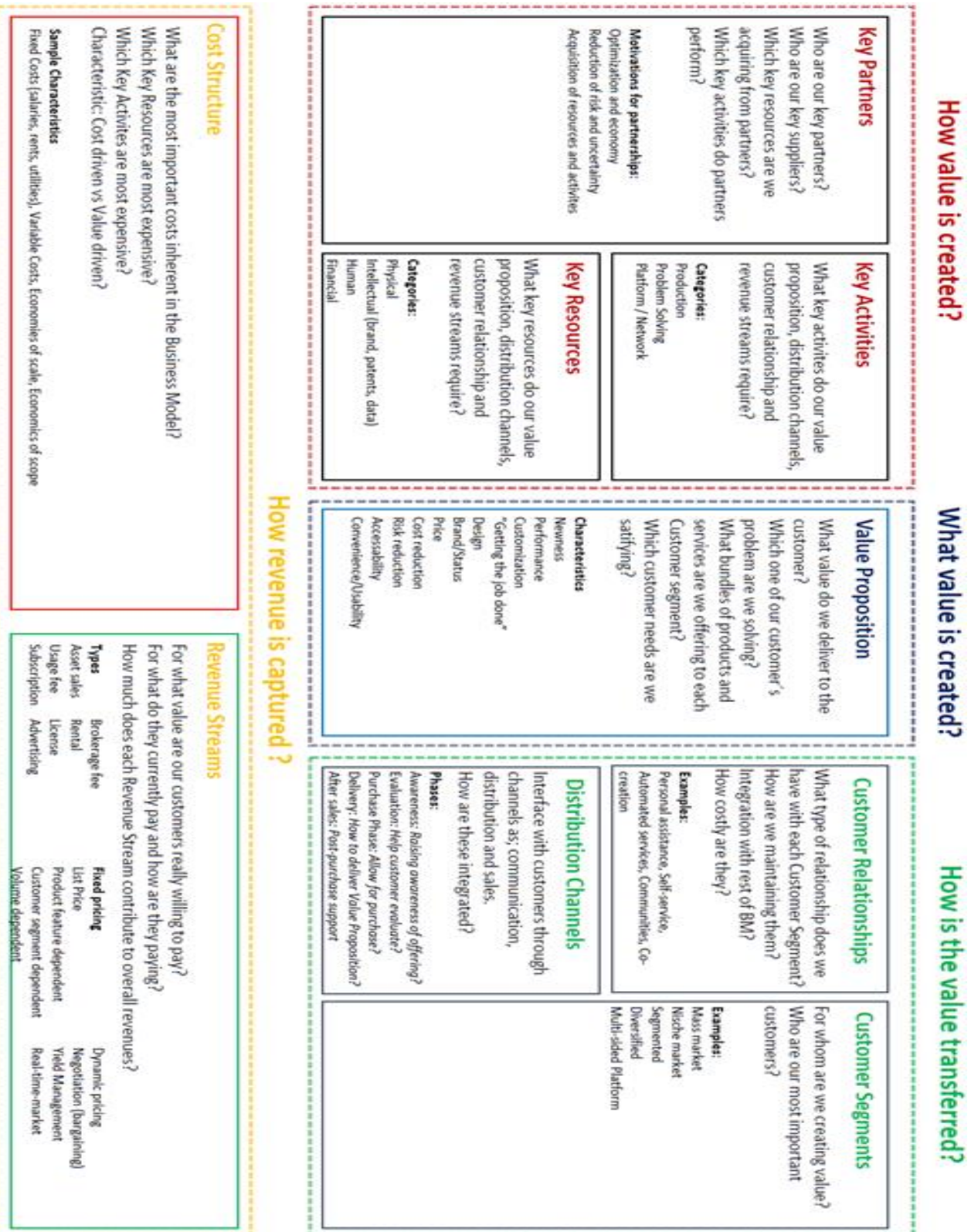
4. Which components in the business model do you consider as being least influenced by the shift from a traditional revenue model to an innovative revenue model?

Thank you for participating in our research!

Best regards

William Bratt & Viktor Dynefors

8.2 BUSINESS MODEL CANVAS FOR INTERVIEWS



8.3 COMPANY BACKGROUND

Company A: A manufacturer's engines for the global market and operates business-to-business. Their engines are used by the customer for several purposes, hence installed in different types of vehicles, machineries, and vessels. A operates mainly with OEMs; their engines are additionally direct sold to end-customers often in terms of repowering the vehicle, machinery or vessel. A uses an external dealer (privately-owned) network for distributing their products. Currently, they do not offer any service agreement and do not work with data analytics for their products. Additionally, they do not offer any form of IRM yet, but they are currently running a project to investigate the future possibilities since their customers are expressing a desire for usage-based and performance-based contracts. Moreover, they see a potential to easier sell their products when the initial upfront costs are reduced. Company A has approx. 2.000 employees and a turnover of 10.000.000.000 SEK.

Company B: B manufactures complete transport vehicles and they offer their products to customers all over the world in form of both governmental and private companies, through their dealer network which consist of both company-owned (internal) and privately-owned (external) dealers. In addition to their product offering, they offer services in terms of service contracts where they have a long experience. Their products have connectivity solutions and they work actively with different types of analytics. They do not offer any IRMs at the moment, but they are currently investigating the possibility with usage-based revenue models due to requests from their customers. Company B has approx. 8.000 employees and a turnover of 30.000.000.000 SEK.

Company C: C manufactures machinery and they offer their products to customers all over the world through their dealer network which consist of only external dealers (privately-owned). C does not possess any extensive knowledge about the functionality, lifetime quality and costs. However, since they recently (a few years ago) launched maintenance and repair contracts in collaboration with insurance partners, they have been able to recently (two years ago) start to offer usage-based and performance-based revenue models, connected to their machineries. They are offering these type of revenue models mainly due to the increased demand among their customers, since their customer experience several of benefits. Company C has approx. 13.000 employees and a turnover of 70.000.000.000 SEK.

Company D: D manufacturer complete transport vehicles and they offer their products to customers all over the world, through their dealer network which consist of both fully-owned (internal) and privately owned (external) dealers. In addition to their product offering, they offer services in terms of service contracts where they have a long experience. Their products are connected and they work actively with different types of analytics. Previously they have offered service contract based on a usage-based revenue model, but due to complexities, they did abandon these activities several of years ago. However, they are currently examining the possibilities to offer both usage-based and performance-based revenue models due to demand for the customers and strategic reasons in terms of diversification to find new ways of capture revenues. Company D has approx. 55.000 employees and a turnover of 220.000.000.000 SEK.

Company E: E manufacturer machinery and they offer their products to customers all over the world through their dealer network which consist mainly of fully-owned (internal) distribution channels, but some machineries of lower sales volume are sold through privately owned dealers. E is currently offering both usage-based and performance-based revenue models where their machines are bundled with a maintenance and repair contract, and is currently in a more mature phase in some

regions but requires development before they offer it on a global scale. They have work with repair and maintenance contract for several of years and do have connectivity in some of their machines. The implementation of IRMs was mainly due to diversification and strategic reason due to intense competition for specific machineries of lower price and quality. With the IRM they are able to illustrate the premiumness and efficiency of their products. Company E has approx. 12.000 employees and a turnover of 30.000.000.000 SEK.

Company F: F manufacturer engines to the global market where they offer both a traditional and an innovative revenue model for their customers. The organization mainly operates within two different segments, where the first, aerospace, is offered a product bundled with a maintenance contract based on an IRM, and in the other segment, vessels, IRMs is only implemented for the maintenance and repair contract. Company F has approx. 50.000 employees and a turnover of 170.000.000.000 SEK.

Experts: The group of experts consist of researchers which all of them are Doctors of Philosophy within a field related to business models and revenue models. Additionally, they all have experience from working at large global manufacturing firms.