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Product Service System for Volvo Trucks:

Finding new business value compliant with IFRS 16 leasing regulations.

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Thesis for the fulfilment of the
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To the best friends in the world. Through thick and thin.

To Bob and Meghan. Thank you is not enough.

To my mother Margaret, thank you for the countless prayers and for teaching me faith. To my brother Marvin, thank you for always having my back and for your undying support. I love you both very much. We did it!

Mungu yu mwema!

Abstract

The International Accounting Standards Board (IASB) in January 2016 published International Financial Reporting Standards (IFRS 16), new guidelines on leasing standards with an effective date of January 1st, 2019. IFRS 16 sets out the principles for the recognition, measurement, presentation and disclosure of leases for both parties to a contract, i.e. the customer ('lessee') and the supplier ('lessor'). Under IFRS 16 the lease classification test i.e. classifying a lease as being on balance sheet or off balance sheet is done away with. This is as a result of the guideline's expectations that all leases are treated as on balance sheet entries.

The objective of this thesis is to develop a model to support Volvo Truck's goal of offering IFRS 16 compliant off balance sheet leasing solutions. Utilizing a 3 step framework, this study identifies the off balance sheet threshold set in IFRS16 and matches it to a Product Service System classification. A Business Model Canvas is utilized to develop a business model that supports this off balance sheet contract.

The thesis finds that by exercising the substantive right to substitute the truck during a lease deployment and by offering capacity based contracts, Volvo Trucks can provide a Product Service System centered, off balance sheet solution, to its leasing clients in compliance with the IFRS 16 regulations.

Keywords: Product Service System, Business Model Canvas, IFRS 16, Leasing, Off-balance sheet, Trucks, Volvo

Executive Summary

Problem Introduction and research objectives

The International Accounting Standards Board (IASB) in January 2016 published International Financial Reporting Standards (IFRS 16), new guidelines on leasing standards with an effective date of January 1st, 2019. IFRS 16 sets out the principles for the recognition, measurement, presentation and disclosure of leases for both parties to a contract, i.e. the customer ("lessee") and the supplier ("lessor") (IFRS, 2016b). Under the new IFRS 16 the lease classification test i.e. classifying a lease as being on balance sheet or off balance sheet is done away with. This is as a result of the guideline's expectations that all leases are treated as on balance sheet (IFRS, 2016b).

At present, Volvo Trucks is able to offer customers off balance sheet leasing solutions through operating leases. Under current IAS 17 accounting regulations, off balance sheet leases are those that fit the classification of an operating lease. In an operating lease the lessee is insulated from the legal responsibilities associated with ownership of the asset. Even though the lessee effectively controls the purchased asset, the lessee does not have to recognize additional debt nor list the lease as an asset on its balance sheet (PwC, 2016).

Beyond January 2019, Volvo Truck's operating leases as they are today would stop offering clients an off balance sheet leasing solution. Consequently, Volvo Truck's customer base of large commercial transporters would have to declare leased trucks on their balance sheet, significantly adding debt, impacting financial ratios such as the gearing ratio, which is a comparison of the debt to equity ratio, an indicator used to assess the financial risk of a business. This can have a significant effect on the lessee's credit rating and shake investor confidence (PwC, 2016).

IFRS 16 however will continue to recognize services and service elements of a lease as off balance sheet expenses. This thesis investigates whether by offering a leasing contract that is fully a service that Volvo Trucks can continue offering an off the balance sheet transportation solution to its customers.

Research Objective and Research Questions

Informed by the background to this research, this thesis sets the objective of developing a rental model for Volvo trucks that is based on product service system. Presented as a service, the goal is to deliver an off balance sheet rental model for Volvo Truck customers.

Utilizing product service system thinking to meet this objective, the research questions are threefold:

1. *RQ1. What are the key attributes of a business model built in line with the PSS ideology and compliant to the provisions of IFRS16?*
2. *RQ2. What is the new customer value proposition in light of the IFRS 16 changes?*
3. *RQ3. How does Volvo Trucks relate to sustainable development aspects in the new value proposition model?*

Methods Employed

In addressing the research objective, this research employs triangulation of data sources and collection methods. Qualitative data is collected from an extensive literature analysis and in-

depth interviews. Quantitative data is sourced from Volvo Truck reports.

In answering RQ1, a literature analysis is used to determine the scope of the IFRS 16 regulations and how leases are defined in the law. Additionally, the literature review is used to establish the definition of off balance sheet per the regulation and the product service system characteristics that best match this definition. Interviews with experts were utilized to give expert opinion and interpretation of the regulation. RQ2 was informed from a literature review of Volvo Truck reports to obtain relevant statistical data on customer preferences towards truck leases. In depth interviews with customers and specialists were utilized to inform the value proposition. RQ3 is addressed through interviews, with customers to understand their environmental perspective and with specialists at Volvo Trucks in gauging value addition potential in this regard.

The data is analyzed utilizing qualitative methods. Data analysis is guided by a three-part analytical framework that first identifies the threshold of off balance sheet as defined in IFRS 16. The second stage is the identification of the Product Service System characteristics that best meet the definition of off balance sheet established in the first stage. The third stage utilizes the business model canvas to define the nine key elements of the PSS business model identified in the second stage.

Findings

Findings RQ1. What are the key attributes of a business model built in line with the PSS ideology and compliant to the provisions of IFRS16?

This research question was approached by answering two sub question. First, was determining the definition of a lease under IFRS 16. The findings identified two key criteria. Identified Asset and Right of Control. A lease is considered an agreement whereby an identified asset and its corresponding control rights are transferred to the lessee.

To meet the threshold of being considered an off balance lease and agreement has to meet the definition of a service whereby value is transferred by way of a truck (asset) whereby Volvo Trucks as a lessor maintains the substantive right to control the application and substitution capability of the asset. Designed as a results based PSS a contract based on capacity utilization in which Volvo trucks holds the right to substitute a deployed truck at any point during the agreement period would be considered a service per the IFRS 16 threshold and therefore off-balance sheet.

Findings RQ2. What is the new customer value proposition in light of the IFRS 16 changes?

An analysis of market intelligence reports on customer value preferences alongside interviews with Volvo Trucks leasing customers revealed that customers are motivated by two key factors in seeking out off balance sheet solutions. Customers subject to IFRS 16 are publically traded companies. An accumulation of long term debt on the balance sheet negatively impacts financial ratios. This in turn negatively impacts investor confidence in the company's shares. The second consideration is capital expenditure. Customers seek out off balance sheet off balance sheet lease solutions to minimize capital expenditure on none core assets. Leasing allows customers to access transportation solutions without the capital cost of ownership. Three key performance indicators are highly considered by customers when deciding on a truck lease namely; Productivity, Fuel efficiency and Uptime. To meet these key performance indicators, capacity contracts whereby utility is charged at a fixed rate of consumption are bundled with Dynafleet and telematics to offer productivity enhancements, fuel savings and uptime guarantee as part of a bundled service offering.

Findings RQ3. How does Volvo Trucks relate to sustainable development aspects in the new value proposition model?

The value proposition is based on providing an all inclusive capacity based contract. In so doing the customer is only responsible for driver costs and fuel costs while utility of the capacity contracts is based on a fixed price per rate of consumption. Fuel becomes the largest variable cost faced by the customer. As one of the single largest variable costs to the lessee, optimizing fuel savings was revealed in literature analysis and specialist interviews to hold the most potential for both cost and environmental savings.

The sustainability inclination of this product service system is to drive down resource and energy intensity. Dynafleet and driver training present the greatest potential of improving driving habits therefore increasing productivity while lowering fuel use. As such, these are included as part of the service offering, with driver training as a way of staving off the rebound effect.

Results

Utilizing the analytical framework, a Business Model Canvas is developed to represent the sustainable new business model supporting off balance sheet capacity leasing contracts. In meeting the objective set out as part of this thesis the Business Model Canvas provides a model to support Volvo Truck’s goal to develop off balance sheet lease contracts.

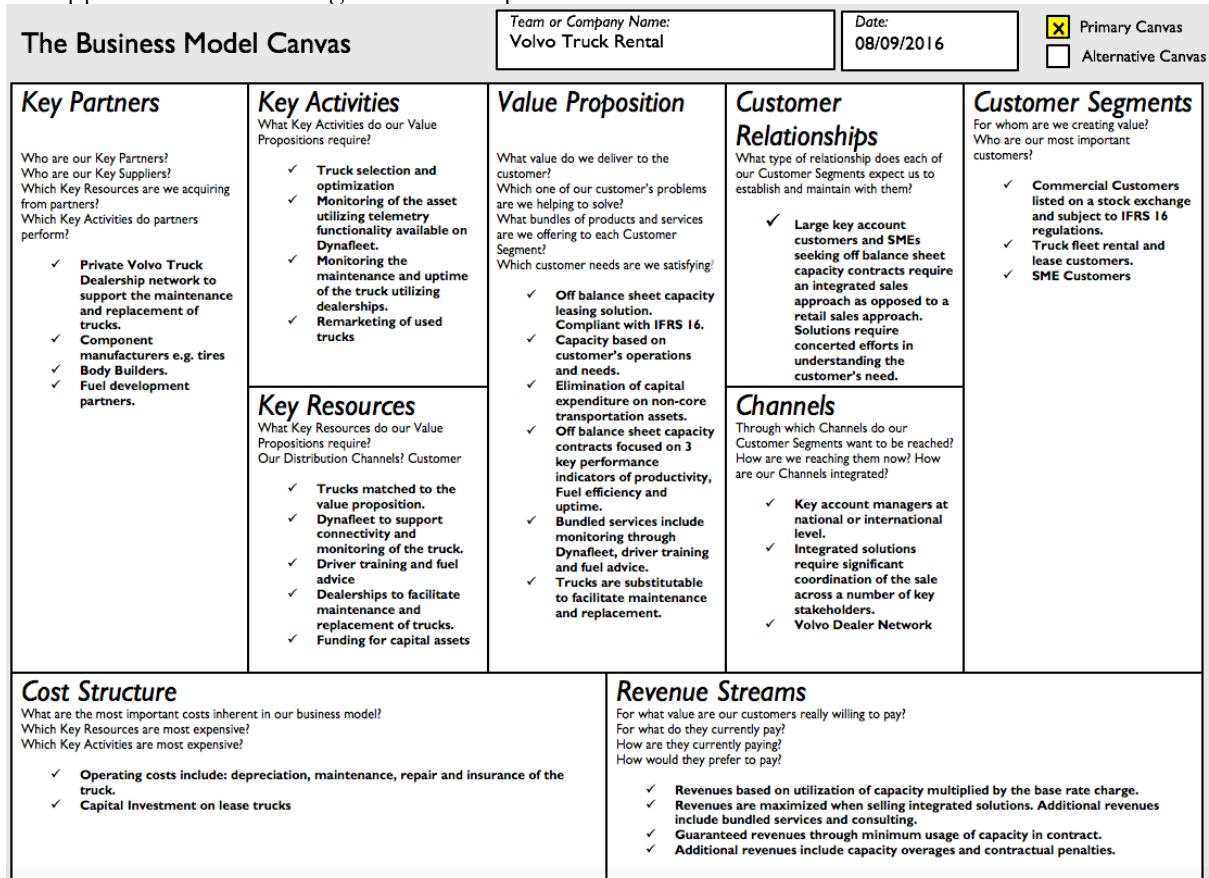


Figure 0-1 Volvo Truck's PSS Business Model

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1 Introduction

IFRS

The International Accounting Standards Board (IASB) in January 2016 published International Financial Reporting Standards (IFRS 16), new guidelines on leasing standards with an effective date of January 1st, 2019. IFRS 16 sets out the principles for the recognition, measurement, presentation and disclosure of leases for both parties to a contract, i.e. the customer ('lessee') and the supplier ('lessor') (IFRS, 2016b).

Leasing

Leasing is a contractual agreement between a lessor (owner) and a lessee (buyer), whereby the owner of the asset monetizes the use and temporary possession rights of that asset for a specific amount of time. The leasing contract operates under specific terms and conditions with the lessee remitting lease payment to the lessor to maintain the contract. A rental though similar to a lease, is defined under IFRS 16 as a contract agreement of no more than 12 months in length (IFRS, 2016b), (PwC, 2016).

Leasing is an extremely important financial tool for businesses and organizations. Leasing enables business to access capital goods including land, premises and equipment without incurring the financial burden of high acquisition costs and cash outflows.

As such, leasing is an important financial solution used by many organizations.

Under current IAS 17 accounting regulations, leases can be classified in two main ways.

1. On-Balance sheet finance leases
2. Off-Balance sheet operating leases (PwC, 2016).

On-Balance sheet finance leases- These capital leases involve a finance company as the lessor. The lessee in addition to having operating rights over the asset, also bears the economic risk associated with the fluctuating financial value of the asset. Under finance leasing, the lessee will have the option of purchasing the asset at the end of the term (Kamath et al., 1990).

Off-Balance sheet operating leases- The lessee in addition to having operating rights over the asset, is insulated from the legal responsibilities associated with ownership of the asset. Even though the lessee effectively controls the purchased asset, the lessee does not have to recognize additional debt nor list the lease as an asset on its balance sheet. There is no option to purchase the asset at the end of the term (PwC, 2016).

Under the IFRS 16 guidelines, all leases, whether financial leases and operating leases will be recognized as on balance sheet leases for the duration of the lease period. This will have consequential effect on the lessee's accounting model as is illustrated in Figure 1-2 . IFRS Summary of balance sheet impact (EY, 2016).

Driving principles of IFRS 16 and definition of a lease contract.

Under IFRS 16 a lease is defined as a contract where the right of use to an asset is granted for a time in exchange for compensation. A lease therefore is a contract that transfers the

right to use and control an identified asset, including subsets that make up the parts of the complete asset.

An identified asset is defined as one which fulfills two criteria.

- There exist no substantial substitution rights for the asset. Substitution is the ability to swap out one asset for another of similar specification.
- In the case of substitution of the asset, no real benefits are had. Benefits are defined as additional value experienced by the lessee and the lessor as a result of substitution.

Right to control is defined as the ability for the lessor to fulfill two criteria during the leasing period.

- Benefit substantially from all of the economic benefits from the use of the asset; and
- Direct the use of the identified asset as to how and for what application the asset is utilized. These driving principles are illustrated in Figure 1-1 IFRS 16 Lease definition summary (EY, 2016).

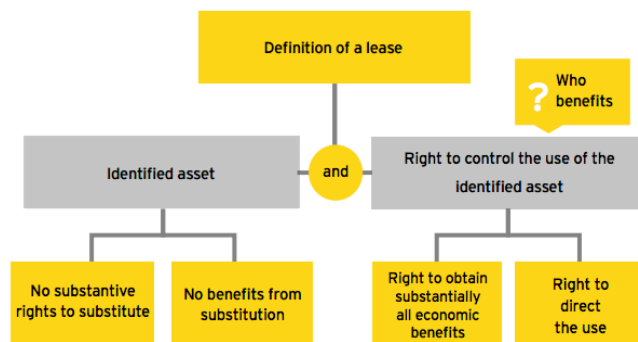


Figure 1-1 IFRS 16 Lease definition summary (EY, 2016).

Challenges raised by IFRS 16.

By having all major leases on the balance sheet (assets below a total value of \$5000 are considered minor (KPMG, 2016)), lessee's will face major challenges primarily in the balance sheet, the income statement, as well as in financial ratio reporting.

Impact on balance sheet.

As a result of the IFRS 16 guidelines, businesses with operating leases will see those assets declared on their balance sheet. Consequentially however, the business will also have to declare the liability to make lease payments on the balance sheet, which will make their debt position higher. This is illustrated in Figure 1-2 . IFRS Summary of balance sheet impact (EY, 2016).




	IAS 17		IFRS 16
	Finance leases	Operating leases	All leases
Assets		_____	
Liabilities	\$\$\$\$	_____	\$\$\$\$
Off balance sheet rights / obligations	_____	 \$\$\$\$	_____

Figure 1-2 . IFRS Summary of balance sheet impact (EY, 2016)

Impact on Income Statement

A move to the IFRS 16 standard will see payments for leases replaced by depreciation and interest expense as illustrated in Figure 1-3 IFRS Summary of Income statement impact on Lessee (EY, 2016). For the lessee, this creates front loaded expenses. In essence, the lease payments are higher in the initial periods of the lease. The lessee will experience decreases in earnings and equity immediately after entering into a lease, a situation that they are buffered from in current operating leases (PwC, 2016).

	IAS 17		IFRS16
	Finance leases	Operating leases	All leases
Revenue	\$\$\$\$	\$\$\$\$	\$\$\$\$
Operating costs (excluding depreciation and amortisation)	_____	Single lease expense	_____
EBITDA		_____	▲▲
Depreciation and amortisation	Depreciation	_____	Depreciation
Operating profit			▲
Finance costs	Interest		Interest
Profit before tax			↔↔

Figure 1-3 IFRS Summary of Income statement impact on Lessee (EY, 2016)

Financial Ratios and Performance

Consequentially, IFRS 16 will impact financial ratios such as a business’ gearing ratio, which is a comparison of the debt to equity ratio, an indicator used to asses the financial risk of a business. This can have a significant effect on the lessee’s credit rating and shake investor confidence (PwC, 2016).

Exemptions to IFRS 16

There are however three exemptions to the IFRS 16 standard.

- Rentals - these are leases equal or shorter than 12 months.
- Services - where an exchange of immaterial value occurs.
- Low value items - these are assets with a total value of equal or less than \$5000 (KPMG, 2016).

1.1 Problem Definition

IFRS 16 presents a number of challenges in regards to Volvo's leasing model. Currently, Volvo trucks offers two specific forms of leasing.

1. Finance Leasing - Through Volvo Financial Services (VFS). Asset purchase option available. This is an on balance lease.
2. Operating leasing - This is an off balance leasing solution.

Volvo Customers and Operating leases.

Currently, Volvo Truck lessees are able to access off balance sheet leasing solutions through operating leases.

In anticipation of the IFRS 16 regulations, Volvo Group Truck Sales in January 2016 published The Truck Market Confidence report (Volvo, 2016d). In this report, 663 potential leasing customers were sampled from 5 key European markets namely, France, Germany, United Kingdom, Poland and Spain.

The following are key indicators, averaged out across Volvo's 5 key markets.

- **Demand:** In gauging lessee consumption, trends for the next two years, X percent of customers expect to maintain their current demand for leased trucks. X percent are expecting an increase in demand over the same time period.
- **Duration of contract:** In discussing the utilization of trucks by lessees the study found that X% of rental customers typically rent trucks for less than 6 months (short term). X% of customer operate leased trucks for up to a year while X% of customer operate long term leases between 1-4 years.
- **Factors that influence lease decision:** When factoring in the decision making process as to whether to purchase a truck lease, the 3 leading factors in the decision making process are price, right truck specification and ease of leasing.
- **IFRS 16's effect on customers:** In gauging how the accounting regulations will affect customer operations through the reclassification of operating leases on the balance sheet, X% of customers said that this change would not affect them. However, X% of customers have indicated that the regulation change would have an effect on their business and lease purchasing decision.
- **Demand for a new off balance sheet leasing solution:** As a follow up question, regarding the effect of the IFRS 16 regulations on customers and demand for an off balance sheet solution beyond 2016, the survey found that a significant percentage of customers would be interested in an off balance sheet solution.

IFRS 16 and lease classification test:

Under IFRS 16 the lease classification test i.e., classifying a lease as being on balance sheet or off balance sheet is done away with. This is as a result of the guidelines expectations that all leases are treated as on balance sheet (IFRS, 2016b). This change in lease classification is highlighted in Figure 1-4 Lease classification IAS 17 to IFRS 16 (IFRS, 2016b).

	IAS 17		IFRS 16
	Finance leases	Operating leases	All leases
Assets	→ ⌌	---	→ ⌌ ⌌ ⌌ ⌌
Liabilities	\$\$	---	\$\$\$\$\$\$
Off balance sheet rights / obligations	---	→ ⌌ ⌌ ⌌ ⌌ \$\$\$\$	---

Figure 1-4 Lease classification IAS 17 to IFRS 16 (IFRS, 2016b)

Under current IAS 17 regulations, off balance leases are those that fit the classification of an operating lease. In an operating lease the lessee is insulated from the legal responsibilities associated with ownership of the asset. Even though the lessee effectively controls the purchased asset, the lessee does not have to recognize additional debt nor list the lease as an asset on its balance sheet (PwC, 2016).

Under IFRS 16 financial leases and operating leases will be indistinguishable as both will be treated as on balance sheet entries. Furthermore, IFRS 16 specifically defines what constitutes a lease. A lease is considered to be an agreement that transfers the right to use and control of an identified asset, including subsets that make up the parts of the complete asset (EY, 2016). A summary of a lease as is defined in IFRS 16 is summarized in Table 1-1 Summary of a lease as is defined in IFRS 16.

Table 1-1 Summary of a lease as is defined in IFRS 16.

Principle	IFRS 16 Criteria 1	IFRS 16 Criteria 2
Identified asset	No substantive rights to substitute	No benefits from substitution
Right to control use of the identified asset	Right to obtain substantially all economic benefits	Right to direct the use of the asset

Leased Services are still off balance.

Though lease classification is not recognized in IFRS 16 as illustrated in Figure 1-5 Lease classification test (KPMG, 2016), the regulations do make a distinction between leased assets and services. An overview of that distinction reads; IFRS 16 does not change the accounting for services. Although leases and services are often combined in a single contract, amounts related to services are not required to be reported on the balance sheet. IFRS 16 is required to be applied only to leases, or lease components of a contract (IFRS, 2016b).



Figure 1-5 Lease classification test (KPMG, 2016)

Research Gap

Overlaying Volvo Truck’s business model of operating leases with the IFRS 16 regulations a disconnect is clear.

IFRS 16 will do away with off balance leasing while a sizable number of Volvo Truck customers will still expect to access off balance sheet transportation solutions.

Under IFRS 16, the service elements of a lease will still be classified as off balance sheet expenses. This research will investigate whether by offering a leasing contract that is fully a service i.e. a contract that’s not based on an identifiable asset and does not meet the criteria of a lease as outlined in IFRS 16’s definition of a lease - that Volvo trucks can continue offering an off the balance sheet transportation solution to its customers.

1.2 Research Questions

Informed by the background to this research, this thesis sets the objective of developing a rental model for Volvo Trucks that is based on product service system. Presented as a service, the goal is to deliver an off balance sheet rental model for Volvo Truck customers.

Utilizing product service system thinking to meet this objective, the research questions are threefold:

1. *What are the key attributes of a business model built in line with the PSS ideology and compliant to the provisions of IFRS16?*
2. *What is the new customer value proposition in light of the IFRS 16 changes?*
3. *How does Volvo Trucks relate to sustainable development aspects in the new value proposition model?*

The three research questions and their accompanying sub-questions are summarized in Table 1-2 Research Questions and Sub-questions:

Table 1-2 Research Questions and Sub-questions

Structure of contract	
RQ1	<i>What are the key attributes of a business model built in line with the PSS ideology and compliant to the provisions of IFRS16?</i>

<i>Sub-questions</i>	<p><i>What criteria will the new contracts need to meet to be considered off-balance sheet as defined in IFRS 16?</i></p> <p><i>What is the structure and logic of the new off-balance contracts?</i></p>
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Value Proposition	
<i>RQ2</i>	<i>What is the new customer value proposition in light of the IFRS 16 changes?</i>
<i>Sub-questions</i>	<p><i>What factors influence a rental decision?</i></p> <p><i>What bundled services are necessary for supporting the rental contract?</i></p>

PSS and Sustainability	
<i>RQ3</i>	<i>How does Volvo Trucks relate to sustainable development aspects in the new value proposition model?</i>
<i>Sub-questions</i>	<p><i>What products and services can be bundled together in the lease to deliver environmental savings?</i></p> <p><i>How can Volvo promote the uptake of best available technologies to its customers?</i></p>

1.3 Overview of Methodology

To answer the research questions presented, this thesis will apply the following methodology. A **literature analysis** informs the theoretical element of product service systems and its application in business models to deliver a service solution based on transport capacity need. **Interviews** are conducted internally within Volvo Truck to understand the organizational goal in implementing a capacity based contract. **Additional interviews** are conducted with customers to understand their segment preferences by understanding their industry specific operations and identifying their transport capacity need. The **Business Model Canvas** is utilized to illustrate the new product service system centered business model. An off balance sheet rental contract based on capacity is also modeled. A detailed methodology section can be found in Chapter 3.

1.4 Scope and Limitations

The research presented is the examination and development of a new business model for Volvo's truck rental operations. The scoping is informed by a number of factors. Legislation change in IFRS 16 is the catalyst. The law has established a need for a service based transportation lease solution.

This in turn informs the choice to investigate solutions based on product service systems which creates its own methodological limitations through the design process. Those methodological limitations are discussed in detail in Chapter 6.

The research presented in this study is sponsored by Volvo Trucks AB. Certain data may not be published as it is subject to non disclosure.

1.5 Ethical Considerations

This thesis is sponsored by Volvo Trucks AB in Sweden. The results of this research present business value to the sponsor.

Certain elements of this research are subject to non-disclosure and may therefore be redacted or anonymized. This is specific to market intelligence reports, syndicated market studies, interviews and surveys.

1.6 Audience

This thesis is the capstone project for the Master of Science in Environmental management and at Lund University's International Institute for Industrial Environmental Economics IIIIEE.

The research presented in this thesis is sponsored by Volvo Trucks AB and is intended to provide a framework to fulfill Volvo Truck's ambition to have a practical business model that is centered on Product Service System.

The research questions seek to address gaps that exist and facilitate the establishment of a practical PSS implementation strategy for Volvo Trucks.

In addition to presenting the thesis sponsor with a new PSS centered business model, the research presented herein develops academic insights into the implementation of Product Service Systems by industry.

1.7 Disposition

Chapter 2 introduces the concept of business models and Product Service System. Additionally, the analytical framework used for the discussion of the results is developed and presented

Chapter 3 highlights the research methodology that is applied in this thesis. It describes the primary methods for data collection.

Chapter 4 and Chapter 5 present the findings of the interviews and literature review and the answers to the research questions. The analytical framework presented in Chapter 2 is utilized to develop a business model and off balance contract.

Chapter 6 provides reflections on the findings and the research methodology. It presents the key conclusions and suggests further research.

2 Context and Theory: Product Service Systems and Business Models

PSS: A background

A Product Service System (PSS) is defined as a configuration of product and service offerings, geared towards satisfying a consumer’s needs and preferences (Goedkoop et al., 1999). Service provision is fundamental to Product Service Systems. It is observed that in PSS, the physical good/asset is but a conduit that facilitates the means by which service is delivered to the consumer (Kowalkowski, 2010; Vargo & Lusch, 2004).

A fundamental cornerstone in service provision and therefore of PSS is the crucial relationship dynamic between service provider, consumers and stakeholders (Vargo & Lusch, 2004). Whereas in product centered models the task of value creation is dependent solely on the efforts of the manufacturer, in PSS, co-creation between various stakeholders within the business environment means that this is a shared responsibility amongst all parties (Jacob & Ulaga, 2008). Value creation is therefore dependent on leveraging the relationship between the PSS provider, the consumer and stakeholders in delivering a competitive service offer (Grönroos, 2011b).

To maintain the focus on service and to deliver value through co-creation (Jacob & Ulaga, 2008), significant changes in the structure of the business model are required in PSS. When compared to the product-centric conventional models, PSS utilizes key relationships to deliver service value. With a delineation between ownership and use rights under PSS - whereby ownership rights of an asset aren’t transferred to the consumer, there is an expectation that client and service support exist for the entire lifecycle to the product (Baines et al., 2007). Unlike in conventional product centered business models where the transfer of ownership and product responsibility expires after sale, Under PSS, a three-way relationship between the asset used for service delivery, the PSS provider and the consumer is maintained for the entirety of the life cycle (A. R. Tan, 2010). The existence of this long term relationship provides benefits for both the PSS provider and the consumer as summarized in Table 2.1 below.

Table 2-1 Overview of Benefits Created by PSS for Providers and Consumers (Baines et al., 2007), (Jacob & Ulaga, 2008), (A. R. Tan, 2010), (Grönroos, 2011b).

PSS Provider	Consumer
<ol style="list-style-type: none"> 1. Development of a competitive advantage through co-creation and unlocking opportunities within markets. 2. Access to performance metrics when the asset is deployed and in use. Big data bolsters the competitive advantage and service delivery. 3. The focus on relationships and co-creation with the consumer means loyalty is developed. Service diversification entails more profit margin in comparison to fixed product offerings. 	<ol style="list-style-type: none"> 1. Services are more flexible and therefore can be tailored to reflect the demand of the consumer and variability in their need. 2. Tailor made solutions allows for a combination of service and product features to match unique consumer needs. The value proposition to the consumer is therefore higher. 3. The burden of asset disposal at end of life is kept with the PSS provider. This creates cost savings on the part of the consumer and reduces their risk and liability.

PSS plays a key role in supporting sustainable consumption habits. In a UNEP report titled *Product-Service Systems and Sustainability: Opportunities for sustainable solutions* notes, The Product-Service System concept is a possible and promising business strategy potentially capable of helping achieve the leap which is needed to move to a more sustainable society (Manzini & Vezzoli, 2002). Further, the report states that in order to achieve this more sustainable society - studies indicate that a sustainable society in the future should use only about 10 percent of the resources that today's industrialized societies are using per-capita - more radical ideas need to be implemented over and above the redesign of products. Requiring a broad systemic change, the report calls for a move to more dematerialized consumption habits as the potential environmental improvement is greater (Manzini & Vezzoli, 2002). PSS indeed is a catalyst for this change in mindset and consumption. There is a move away from capitalizing on resources for revenue generation, with businesses focusing instead on a value driven approach (Meier et al., 2010).

2.1 Types of PSS

Product Service Systems can be broadly classified into 3 main classes:

- **Product Oriented Services (POS)** - In this PSS model classification, the primary objective is the sale of assets. In this model, ownership of the asset is transferred to the consumer who bears the risk associated with ownership. Add on services are included as extras to support the function of the asset. These services include after sales maintenance, repair and servicing. This PSS model achieves its sustainability objective by reducing the costs of using the product (Tukker, 2004).
- **Use Oriented Services (UOS)** - In this PSS model classification, the primary objective is still geared on the asset. The main distinction is however, that the product is not sold to the consumer. Rather, ownership is maintained by the PSS provider throughout the life of the asset, with the use rights made available to one or many consumers. The longevity of the asset is crucial in delivering sustainable economic benefit as there is a direct correlation between asset life and usage and its monetization. With the ownership risk maintained by the PSS provider for the duration of the asset's life, efficient and durable design is a key element of the asset. Higher efficiency and durability over the life of the asset achieves PSS's sustainability objective of reducing material use and operating costs (Tukker, 2004).
- **Result Oriented Services (Chesbrough & Rosenbloom)**- In this PSS model classification, the primary objective is primarily geared on service provision. In this model no particular pre-determined asset is involved, with the focus rather being on the execution and the results of the service involved. This result driven PSS model achieves its sustainability objective by reducing material use and operating costs. The assets in this instance are only a conduit for service delivery and the PSS provider maintains ownership of the asset (Tukker, 2004).

The classification of PSS is summarized in Figure 2-1 Overview of PSS Classification (Tukker, 2004) below.

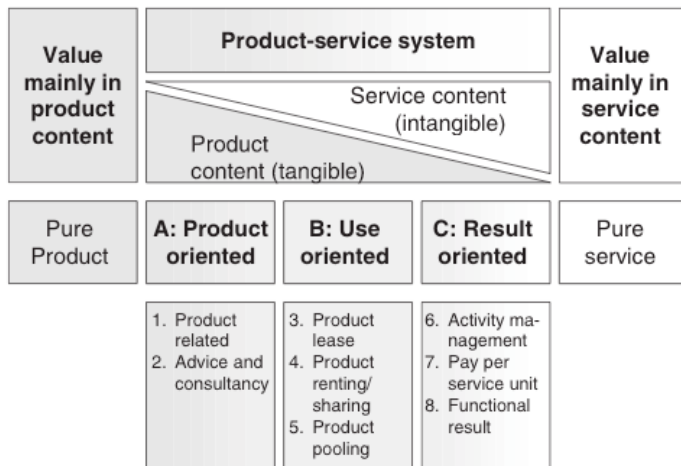


Figure 2-1 Overview of PSS Classification (Tukker, 2004)

2.1.1 Examples of PSS in Industry

In illustrating PSS applications in industry, a number of practical examples exist whereby product and service elements have been utilized to deliver value to customers namely:

1. Xerox- Rather than selling copier machines, Xerox utilizes a pay-per-copy model for selling office equipment. Customers are charged for the utility of the copier without transferring ownership of the asset.
2. Rolls-Royce –As a leading manufacturer of jet engines, Rolls-Royce offers customers Power-by-the-Hour service packages for aircraft engines, where customers are charged for the utility of the jet engines per hour used. These contracts cover maintenance and repair of the engines provided by Rolls-Royce.
3. Atlas Copco –A leading manufacturer of air compressors, Atlas Copco offers a Contract Air service, whereby customers purchase compressed air per meter cubed (m³) without the need to own the actual air compressor.
4. Philips – Specific to Philips Lighting, customers utilize a pay-per-lux model, whereby customers pay for the level of illuminance in a building.
5. Michelin –Specific to tires, Michelin as part of a fleet management solution leases tire tread based on kilometers driven (Van Ostaeyen, 2014)

2.1.2 PSS and Sustainability

Sustainability, though not explicitly mentioned in the definition of a Product Service System as presented in Chapter 2, is recognized in literature as having the potential to deliver sustainable solutions over and above conventional models if they are designed with that in mind (O. Mont, 2000). PSS attempts to address the consumer need through a combination of product and services. The sustainability of a PSS system is gauged on its ability to provide the capacity to fulfill the consumer’s need. This approach has the potential off unlocking sustainability benefits by lessening the raw material usage, improvements in disposal and end of life management as well as reduced energy intensity in the usage phase. These benefits are achieved due the PSS provider’s ownership and management of the asset throughout its lifecycle (Tukker & Tischner, 2006a).

Function - the ability for a combination of products and services to deliver value, is achieved through the thoughtful and integrated approach with which the model’s elements are designed. PSS by way of jointly incorporating stakeholder efforts, can converge and boost sustainability optimizations in the entire business eco-system of partners (O. Mont,

2000), (Manzini & Vezzoli, 2003). In fulfilling a function, a PSS can optimize business elements to offer the most efficient combination of resources within the system (Goedkoop et al., 1999). The ability to address a function with a variety of resources gives PSS the dexterity to find efficiencies and optimizations in resource use in the production phase (O. Mont, 2000), (Manzini & Vezzoli, 2003).

Optimizations in resource use during production also have the potential of addressing unsustainable consumption habits. In conventional models, production and consumption have a direct correlation. As consumption rises, so do does production and resource intensity. However, the idea of decoupling is presented in literature as the ability to achieve economic growth (characterized by growing production capacity) without triggering additional pressure on environmental and energy resources (Tukker & Tischner, 2006a). Decoupling can be characterized in two ways. Decoupling can be achieved by keeping environmental and energy intensity growth proportionately smaller to the economic expansion. Decoupling can also be absolute, whereby the intensity on environmental and energy resources is lowered while at the same time achieving economic expansion (Tukker & Tischner, 2006a). Literature points to the latter, absolute decoupling, as the means by which industry can mitigate the environmental pressures related to consumption and climate change. To meet this goal, sustainable product service systems must be designed with two objectives in mind.

Efficiency - This involves the redesign or optimization of the production process with the goal of reducing resource and energy intensity while achieving productivity targets.

Longevity - The expression of environmental and energy savings need to be guarded against the rebound effect. The rebound effect is a situation where the environmental benefits of decoupling achieved by production system and technological efficiencies are eroded by a relapse in consumption behavior characterized by overconsumption (Tukker & Tischner, 2006a).

2.1.3 Economic, Environmental and Social Benefits of PSS

As previously highlighted, Product Service Systems address the consumer's need by presenting functional applications of product and service combinations. A sustainability driven PSS has the ability to deliver on a triple bottom line of profit maximization, environmental stewardship and people promotion and development.

Leveraging its core characteristic of applying the most efficient use of resources to produce a functional solution based on product and service combinations, a sustainable PSS creates economic value through competitive advantages as a result of product differentiation, innovative thinking, tailor made functional solutions and flexibility allowing for strategic pivoting (O. K. Mont, 2002), (Tukker & Tischner, 2006a).

The environmental benefits of a sustainable PSS are achieved through the decoupling effort of resource and energy intensity reduction. Further extrapolation of these benefits means a reduction in waste streams and hazardous materials. These two reductions are achieved when ownership of the asset is in the hands of the PSS Provider, whereby longer product lifecycle and end of life management are internalized. (O. K. Mont, 2002), (Omann, 2007; Tukker & Tischner, 2006a). Further on the PSS provider's ownership of the product, there is a greater onus on the producer to minimize resource intensity, while at the same time maximizing better utilization of the asset. This is particularly more

evident in result oriented PSS, where the objective is primarily geared on service provision. This result driven PSS model achieves its sustainability objective by reducing material use and operating costs (Tukker, 2004) (Tukker & Tischner, 2006a).

In achieving social benefits, a sustainable PSS through the utilization of relationship networks is able to apply the most efficient resources within the business network to deliver innovative solutions for consumers. This creates economic choice for consumers and instills market vibrancy. Barriers to entry and ease of access are also key benefits of a PSS. Ownership is not a prerequisite to access and with PSS models, lease and rental solutions allow consumers to access a variety of product and service options that would otherwise be out of their reach or financially prohibitive (Van Nes & Cramer, 2006).

2.1.4 Sustainable PSS: Drivers and Barriers

A sustainable product service system is said to be one whereby all resources within the business network environment are optimized by converging the efforts of stakeholders towards meeting the goal of value creation (Manzini & Vezzoli, 2003). Table 2-2 Internal and external drivers and barriers in the development of sustainable PSS (O. K. Mont, 2002).

Table 2-2 Internal and external drivers and barriers in the development of sustainable PSS (O. K. Mont, 2002)

	Internal	External
Driver	<ul style="list-style-type: none"> • Potential revenue growth and cost savings. • Potential avenues of new resource availability • Management buy-in • Risk mitigation • Environmental mission 	<ul style="list-style-type: none"> • Legislation • Growth in market opportunities • Competency development
Barriers	<ul style="list-style-type: none"> • Organizational inertia and resistance to change • Imbalance between environmental mission and customer demands 	<ul style="list-style-type: none"> • Underdeveloped stakeholder relationships within the value chain • Prohibitive labor costs • Lack of demand

Additional barriers can be experienced in the development of a sustainable PSS particularly when it comes to interfacing with the consumer.

Product ownership and the consumer’s inability to let go of the conventional mindset that equates ownership with access rights can be a difficult barrier to overcome (O. K. Mont, 2002). In this instance, consumer’s must be provided with the relevant information required to reshape their consumer habits regarding this issue (O. K. Mont, 2002) (Gottberg et al., 2010).

2.2 Business models

There exist a number of definitions for what a business model is. Casadesus and Ricart (2010), suggest that a business model is the means by which an organization addresses two main issues. Namely, how to create value for customers and how to capture a profit in

return (Casadesus-Masanell & Ricart, 2010). This definition is also reflective in the earlier work of Peter Drucker where in *The Principles of Management* he asserts that a business model can be answered by four key questions. Who is the customer? What is the customer's preference? How is money made from satisfying the customer need? How can the customer need be satisfied at a competitive price? (Drucker, 1954).

This logic in determining the nature of a business model is also supported in the findings of Shafer et al where they describe a business model as a representation of a business's core logic and strategy (Shafer et al., 2005). Building on this, later research into business models furthers the idea of strategic choice stating that a business model embodies an organization's strategic choice, through its ability to define, develop and deliver value. To develop a strategic choice, a business model presents methodologies to capture, synthesize, develop and study the evolution of this core logic (Osterwalder & Pigneur, 2013).

In so doing, a business model is a tool that visualizes this logic and the structure the business assumes in order to maximize its value from its resources. Presented in the book, *Business model generation: a handbook for visionaries, game changers, and challengers*, Osterwalder asserts that as a tool, the sum of the parts of a business model is the combination of objects, characteristics and the relationships therein, that make up the business logic. The business model encapsulates these complexities and presents it holistically (Osterwalder & Pigneur, 2013).

2.2.1 Purposes of business models

Understanding the purpose of business models and their intended benefits is discussed in literature as the fulfillment of a number of factors. In the widely cited paper, *The business model: recent developments and future research*, a business model's purpose is discussed as an analytical tool that allows for the holistic examination of a business's internal and external activities. Further, a business model's purpose is to capture and create value (Zott et al., 2011).

The business model is also discussed as a mediation tool that bridges technology and economic value. To this point, business models as management tools allow business decision makers to capture the value of a technological element, and derive commercial gain in the market by presenting consumers with a value proposition that meets their preference. The business model further to the value proposition, defines the market segment, the value chain, costs, revenue and competitive strategy (Chesbrough & Rosenbloom, 2002). Subsequent literature has gone further to describe the business model as the organizational and financial architecture necessary to bridge innovation and the market (Teece, 2010), (Zott et al., 2011).

In of itself, the development of a business model is not a guarantee or predictor of the success of a business (Chesbrough & Rosenbloom, 2002). Rather, the success of the enterprise is dependent on the business's ability to derive value from innovative technologies (Zott et al., 2011). For the business model to be successful, it must mirror the goal of delivering value and recouping revenue. As such, a business model is not a

stagnant form, but rather an ongoing refinement of operational logic in value delivery and revenue maximization (Chesbrough & Rosenbloom, 2002).

The business model is therefore a confluence of two forms of functionality namely;

Business analysis - A business model functions as an analysis tool of the business structure

Value delivery - A business model is the bridge allowing innovations to reach the market, maximizing revenue.

2.2.2 Business model elements

The building blocks and the fundamental components of a business model are widely discussed in literature. Described as elements, dimensions and building blocks (Ballon, 2007), earlier works pointed to business models being composed of two key elements namely, what the business does and how the business creates commercial value from these activities (Weill et al., 2005). As such, these two elements of the business model encompass assets owned by the business - The physical, financial, intellectual and human resources available to the business - as well as the relationship value with the consumer (Weill et al., 2005). Subsequent literature writes of business models as being composed of recurring elements, which on a granular level, is the harmonization of a business's characteristics and activities. A business model summarizes the interaction of these elements (Baden-Fuller & Morgan, 2010).

Elements as building blocks:

In presenting business model elements, the framework developed in *Business modelling revisited: the configuration of control and value* by Ballon, outlines the parameters of value network, functional architecture, financial modeling and the value proposition (Ballon, 2007). However, this framework solely focused on the internal mechanics of the business and did not account for stakeholders that include, customers, competitors and the environment. Later research has improved on these deficiencies. As presented in, *The business model: recent developments and future research*, the framework proposed outlines three key elements:

Notion of value: Examples of these include; Value stream, customer value, value proposition.

Financial Aspects: Examples of these include; Revenue Streams and Cost Structures.

Partner Network Architecture: Examples of these include; delivery channels, network relationships, logistical streams, infrastructure (Zott et al., 2011).

The idea of a business model as a communication tool is best illustrated by the development of the business model canvas. Presented in *Business model generation: a handbook for visionaries, game changers, and challengers*, the framework is designed as an illustrative means by which a business can be analyzed, understood and managed (Osterwalder, 2004), (Osterwalder & Pigneur, 2013).

2.3 Business models as they relate to key business concepts.

Applicability is key when discussing a business model. Therefore, it is necessary to develop an understanding as to how the business model interacts with other key business areas concepts. A summary of these concepts as presented in literature include:

1. Value Creation
2. Business Strategy
3. Organizational alignment
4. Business activities and resources
5. Business costs and revenues
6. Innovation and idea development

2.3.1 Value Creation

Value and its creation have been under marked with various theories in literature. Presented in the journal paper, *The business model: recent developments and future research*, value creation is derived from four key sources namely; Lock-in, complementarities, efficiency and novelty. The complementary nature of these sources of value can be applied through various business models. In their observation, business models deliver innovative ways of creating value (Zott et al., 2011).

Business models present a means for measuring the performance of a business when it comes to assessing value. Business models have the ability to function in two ways. By way of employing value creation mechanisms, (Amit & Zott, 2001) - the perceived benefit to the customer (Verdin & Tackx, 2015), or by value capturing mechanisms (Zott et al., 2011) - the pricing and cost structures of the business (Verdin & Tackx, 2015). In measuring value, a customer will only pay if the perceived value created is higher than the monetary cost of acquisition (Anderson et al., 2009). Value creation goes beyond the customer. Indeed, value creation is assessed on the stakeholder view that value is created amongst customers, partners and suppliers (Brandenburger & Stuart, 1996), (Amit & Zott, 2001).

Both value creation and value capturing mechanisms operate within a value network, which is composed of the resources available both to the business and to its network partners (Zott et al., 2011). The business model is far from a play by play handbook on how to run and operate a business. Rather, a business model is a hypothesis geared at delivering customer value, and recouping the commercial benefits through revenues (Chesbrough & Rosenbloom, 2002). A business model takes a stand alone technological innovation which in of itself presents no objective value, and directs it towards presenting benefit to the consumer providing commercial relevance and benefit (Chesbrough, 2010).

2.3.2 Business Models vs. Strategy

In discussing value creation, the stakeholder approach of creating value within the value network is emphasized (Brandenburger & Stuart, 1996), (Amit & Zott, 2001). Whereas business model literature forwards the notion that value is captured through partnerships and cooperation, business strategy literature on the other hand, discusses value capturing with an emphasis on competition and maximizing competitive advantage (Zott et al., 2011). As presented by Chesbrough, a business model is not a play by play handbook on how to run and operate a business. Indeed, the term business model and strategy are

confused and wrongly used interchangeably (Magretta, 2002) (Casadesus-Masanell & Ricart, 2010).

Strategy by definition encompasses the deliberate actions, tactical responses and organizational learning employed by management to create sustainable competitive advantage (Mansfield & Fourie, 2004). Comparing and contrasting a business model to strategy points to the latter being employed in response to competitive pressure, while the business model remains a blueprint on how the business meets the needs of the consumer (Seddon & Lewis, 2003).

Business models embody the logic employed in delivering value but not the strategic nuances of implementation. Different strategies can be employed in response to different competitive environments all within a single business model. However, a business model is a reflection of a business entity and therefore is unique to an organization (Magretta, 2002), (Seddon & Lewis, 2003).

Product-market strategies - whereby the focus is on value capturing, sustainable competition, competitive advantage and differentiation (Chesbrough & Rosenbloom, 2002), (Magretta, 2002), (Mansfield & Fourie, 2004), (Zott et al., 2011) are complementary to business models - which are an activity system that is focused on how the business works to deliver value to the consumer (Casadesus-Masanell & Ricart, 2010), (Zott et al., 2011).

Businesses operate within a competitive environment in their bid to deliver value to their customers. Strategy is the means by which a business retains its competitive advantage over its rivals to sustain its existence within this environment (Mansfield & Fourie, 2004). Differentiation and therefore competitive advantage is hinged on the business model and strategic decisions made in positioning the business in the market. The prerequisite to success is the clear formulation of goals and objectives within strategy, fostered by a well designed and clear business model (Magretta, 2002), (Mansfield & Fourie, 2004).

2.3.3 Business Models vs. organizational alignment

Business models communicate to members of an organization the manner in which the business seeks to deliver value to its customers (Magretta, 2002). The business model canvas developed by Osterwalder and Pigneur is an illustrative approach at communicating a business model within an organization (Osterwalder & Pigneur, 2013). Communication is a key prerequisite to developing buy in from within the organization. Effective new business model development is a collaborative process that involves management and employees. In so doing, buy in is created and there is less chance from failure that would otherwise occur if employees are unaware of the business model and their role, or if employees resist the implementation of a business model due to lack of inclusiveness (Santos et al., 2009). Comparative bias and resistance to change also pose a threat to the success of a business model. Innovative new business models can face bias when managers and employees compare their performance to an existing and successful business model. This bias if unchecked can stifle innovation and prevent a business from realizing revenues and new market opportunities (Chesbrough & Rosenbloom, 2002).

2.3.4 Business Models and resources and activities

Value, as previously discussed in the earlier sections, is a critical deliverable of the business model. To create value, resources and activities are required (Chesbrough & Rosenbloom, 2002), (Zott et al., 2011).

To meet its value proposition, a business model applies resources in the creation, communication and delivery of the value proposition. For a business to remain competitive it must allocate the necessary resources to remain sustainable and deliver on its competitive advantage (Barney, 1991).

The nature of resources available to the the business include tangible, intellectual, financial and human resources. For value to be created, these resources need to be leveraged through business activity (Kraaijenbrink et al., 2010).

2.3.5 Business Models vs cost and revenue streams

The purpose of any business model is to deliver value with the expectation of revenue generation. Value created within a business model is measured against the net financial benefit realized by the stakeholders i.e. the business's customers, partners and suppliers (Brandenburger & Stuart, 1996), (Ritter et al., 2004).

The effectiveness of a business model is its ability to have mechanisms in place to acquire the financial revenues related to the value delivered. However, taking into consideration the stakeholder view of value creation amongst network partners, not all value realized within the network, i.e. Non monetary benefits, can be captured by the revenue collection mechanisms within the business model (Brandenburger & Stuart, 1996), (Chesbrough & Rosenbloom, 2002).

As the architecture that facilitates revenue collection (Chesbrough & Rosenbloom, 2002), a business model summarizes the logic of value creation and a business's ability to recoup financial benefit by applying its resources to gain competitive advantage within a market (Teece, 2010).

2.3.6 Business Models Vs Innovation

Business models are the medium by which new technological innovations can be brought to market by a business (Teece, 2010). A business's ability to innovate and bring new technologies to market has a direct correlation with success and longevity of the enterprise (Zott et al., 2011).

Innovation within a business model can occur in a number of ways. Innovation can be achieved through the reengineering of internal processes and resources or through collaborative efforts within the value network, whereby stakeholder relationships are leveraged to realize new products and services (Zott et al., 2011). This open innovation strategy involves pooling ideas from customers or resources from the supply chain or competitors, to deliver on new innovations to bring to market (Dahlander & Gann, 2010).

Development of a new business model is necessary to bring innovation to market. Innovation is a necessary element for a business to remain relevant and competitive within

a market. Whereas business develop their core competency at realizing innovative technologies and ideas, often times there is a disconnect in their ability to develop a model to support this innovation (Chesbrough, 2010). Often times there is an iterative and experimental process to perfect a business model to support a new innovation. The risk associated with the development of a new business model can be viewed as threatening to the existence of a prevailing model, and inertia can be expected when seeking management buy-in (Chesbrough, 2010).

In supporting this experimental and iterative process of business model development, the construction of mapping frameworks is necessary to outline the logic of the development (Chesbrough, 2010). Frameworks such as the Business Model Canvas allow managers to experiment with new business model ideas. However, literature notes that frameworks such as the Business Model Canvas (Osterwalder & Pigneur, 2013,) only facilitate the experimentation process. The decision to undertake business innovation is however dependent on the willingness of the business's management to support it (Chesbrough, 2010).

Assuming buy-in from management and the utilization of frameworks such as the Business Model Canvas, the experimental approach to innovation and business model development can be accomplished through effectuation (Chesbrough, 2010). Effectuation is the attempt to identify opportunities and new venture creation in uncertain market conditions where the outcome of the experiment is unpredictable. Effectuation is the entrepreneurial tool of being presented with a set of means and finding new ends. This is the opposite of causality, whereby the outcome and the business environment is known making the result of a decision predictable (Sarasvathy, 2009).

Leadership plays a crucial role in the innovation process. Comparative bias is often a challenge that top management have - where there is a bias for old models. In exacting a different mode of thinking and spurring innovation, the role of middle level managers is to advocate for the experimentation around new business model development (Chesbrough, 2010). Successful management of innovation requires organizational ambidexterity, whereby management can focus effectively between efficiently running the business and innovating to guarantee longevity of the enterprise (Raisch et al., 2009). Innovation is key for a business to sustain itself in an evolving market. In addition to clear leadership and managerial buy-in, resources would need to be made available to facilitate the creative process, leading to discovery driven business models (McGrath, 2010).

Technological innovation is the nucleus upon which new business model development occurs. Regardless of how innovative the technology is, research has shown that without the proper business model to bring it to market, even the most innovative of solutions is bound to fail (Teece, 2010). The failure of discovery driven technological innovations in literature has been attributed not to a failure in the technology itself, but failure in capturing and delivering customer value (Chesbrough & Rosenbloom, 2002). Business model innovation is therefore crucial in positioning an innovative technology within the market to ensure value is both created and captured (Teece, 2010).

Effectuation as earlier discussed, is an entrepreneurial tool whereby the means are often clear but not the end (Sarasvathy, 2009). The challenge of discovery driven innovations and indeed the business models to support them is that there is often limited information

about the market and how the innovation interacts with it. As such, the innovative process is a balance between synthesizing market intelligence where available and coupling it with 'outside the box' innovation in the hopes of delivering a technology that creates value for the consumer and a business model that effectively captures it (Teece, 2010).

2.4 Framework to support the adoption of PSS

Literature proposes a number of elements that a business model should be built on. An extensive study of business model constructs revealed 54 unique elements that business models consist of (Abd Aziz et al., 2008). This extensive list of elements as presented by Abd Aziz et al., points to a wide ranging possibility of element combinations available in facilitate the creation of business models. However, their proposed framework presents complexities that hinder the ease of establishing the characteristics of the elements and the manner in which they relate to one another.

Subsequent studies as presented by Osterwalder and Pigneur in their widely acclaimed book titled, *Business model generation: a handbook for visionaries, game changers, and challengers*, condense the exhaustive number of business elements into a concise number, that allows for the analysis of a business's ability to implement PSS (Osterwalder & Pigneur, 2013). Osterwalder and Pigneur's Business Model Canvas is the result of years of investigation and collaboration related to business model development, amongst as wide ranging constitution of academics and industry. The Business Model Canvas is widely in industry, having been practically utilized to develop business models for leading multinational corporations that include Ericsson and IBM (Osterwalder & Pigneur, 2013).

The Business Model Canvas presents a succinct list of nine key elements that comprise a business model as presented in Figure 2-2 Overview of the nine Elements of The Business Model Canvas (Osterwalder & Pigneur, 2013).

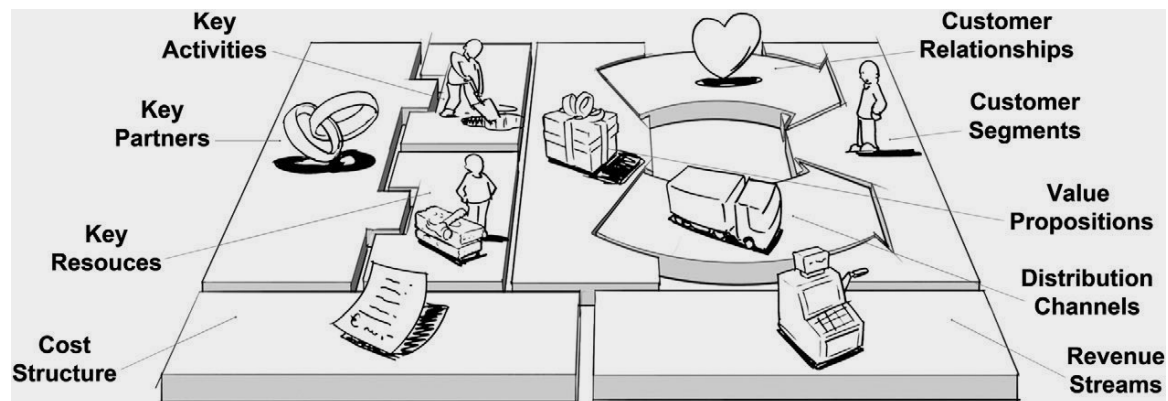


Figure 2-2 Overview of the nine Elements of The Business Model Canvas (Osterwalder & Pigneur, 2013).

The nine elements are summarized in Table 2.4 below:

Table 2-3 Description of the nine Elements of The Business Model Canvas (Osterwalder & Pigneur, 2013).

Acronym	Element	Description
CS	Customer Segments	An organization serves one or several Customer Segments.
VP	Value Proposition	It seeks to solve customer problems and satisfy customer needs with value propositions.
CH	Channels	Value propositions are delivered to customers through

		communication, distribution, and sales Channels
CR	Customer Relationships	Customer relationships are established and maintained with each Customer Segment.
R\$	Revenue Streams	Revenue streams result from value propositions successfully offered to customers.
KR	Key Resources	Key resources are the assets required to offer and deliver the previously described elements...
KA	Key Activities	...by performing a number of Key Activities.
KP	Key Partnerships	Some activities are outsourced and some resources are acquired outside the enterprise.
C\$	Cost Structure	The business model elements result in the cost structure.

Given the ease of use of The Business Model Canvas as presented by Osterwalder and Pigneur, as well as the peer reviewed nature of the framework by multinational corporations of a similar size to Volvo Trucks, the Business Model Canvas will be the reference framework for this study.

An element that is not included in the Business Model Canvas is a competitive strategy. As previously discussed in Chapter 2.3.2, Chesbrough states that a business model is not a play by play handbook on how to run and operate a business (Chesbrough, 2010). Indeed, the term business model and strategy are confused and wrongly used interchangeably (Magretta, 2002) (Casadesus-Masanell & Ricart, 2010). Osterwalder and Pigneur in their analysis also make a similar observation that strategy thought complementary of a business model, is distinct in its own right (Osterwalder & Pigneur, 2013).

The development of a strategy can occur prior or in parallel to the development of the business model (Osterwalder & Pigneur, 2013)

2.4.1 Analytical Framework

In a report published by the Dutch Ministries of environment (VROM) and economic affairs (EZ) titled, *Product service systems, ecological and economic basics*, considers a number of aspects pertaining to the definition of a Product Service System. Thus, a product Service System attempts to lower environmental impacts by applying a system of products, services, infrastructure and networks to competitively meet the demands of the consumer (Goedkoop et al., 1999).

In proposing features for adoption of PSS, literature points to a number of aspects including:

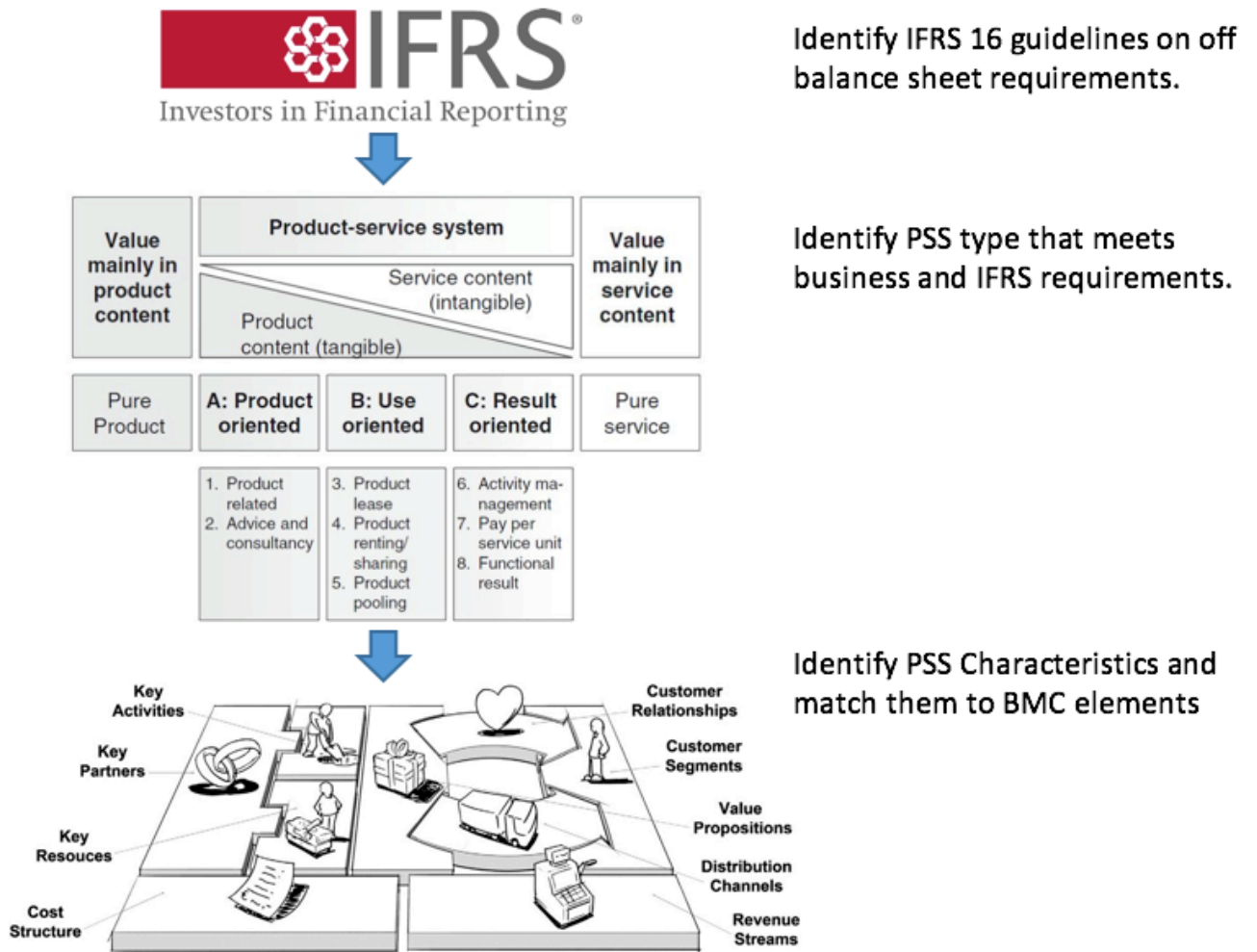
- Shifting focus from a product-centric to a system-centric approach of operations.
- Developing and heightening the relationship with consumers.
- Incorporating consumers as active contributors to product development.
- Tailor made design, production and delivery methodologies
- Product lifecycle thinking and incorporating end of life management.
- Stakeholder driven business objectives focused on the triple bottom line (Goedkoop et al., 1999), (Baines et al., 2007).

This thesis sets about developing a framework to support Volvo Trucks adoption of a Product Service System. This framework takes into consideration the background information developed in Chapter 1 as well as the aspects presented within the literature review in this chapter.

Step 1. The identification of the business objective is the first stage in the development of the PSS Centered business model. The research objective identified in Chapter 1.2 is to firstly develop an off balance sheet rental model for Volvo Trucks. This involves identifying the guidelines and restrictions the IFRS 16 legislation outlines in regards to leasing contracts (IFRS, 2016b). The identification of what is considered off balance sheet per the IFRS 16 guidelines informs the subsequent step.

Step 2. Utilizing the PSS classification criteria developed by (Tukker, 2004), Identify the PSS type that best meet's Volvo Truck's objective of providing an off-balance sheet rental contract as mapped out in step 1.

Step 3. Once a PSS type is identified according to the criteria presented in (Tukker, 2004), the Business Model Canvas developed by (Osterwalder & Pigneur, 2013) is utilized to map out the PSS business model. The nine elements of the business model as presented by (Osterwalder & Pigneur, 2013) are then aligned with Product Service System characteristics identified in literature. The PSS business characteristics will be matched against the current business model, allowing for a comparative analysis on the total offer between the new and old business models. This has the added benefit of spreading risk in the migration over to the PSS model, as barriers can be identified prior to its full operationalization (A. R. Tan, 2010). The analytical framework is visualized in Figure 2-3 Overview of the 3-step framework to support adoption of a PSS business model.



Identify IFRS 16 guidelines on off balance sheet requirements.

Identify PSS type that meets business and IFRS requirements.

Identify PSS Characteristics and match them to BMC elements

Figure 2-3 Overview of the 3-step framework to support adoption of a PSS business model.

2.4.2 Contextualizing PSS Characteristics to Business Model Canvas Elements

A number of Product Service System adaptations are presented in literature. Based on the nine Business Model Canvas elements identified in Table 2.4, Table 2.5 presented below will match PSS characteristic adaptations identified in literature to those presented in the Business Model Canvas.

Table 2-4 2.4.2 Contextualizing PSS Characteristics to Business Model Canvas Elements

Acronym	Element	Description	PSS Characteristic to Adapt
CS	Customer Segments	An organization serves one or several Customer Segments.	A customer segment is defined as a proportion of a market that shares identical characteristics. Segments can be identified based on their use of an asset (Tukker & Tischner, 2006b). The main adaptation as it pertains to customer segments is to realign consumer asset ownership and use habits, by delineating ownership and access (Roy et al., 2009), (Wilkinson et al., 2009). PSS adaptation involves shifting asset ownership and risk to the PSS provider (Beuren et al., 2013).
VP	Value Proposition	It seeks to solve customer problems and satisfy customer needs with value propositions.	A value proposition beyond satisfying the needs of the consumer, presents a number of PSS characteristics that can be adapted. Cost and risk reductions are two key benefits that can be realized and passed on to the consumer through a PSS (Beuren et al., 2013). With ownership retained by the PSS provider throughout the life cycle of the product, the up-time and reliability of the asset in addition to the maintenance and repair costs can best be managed by an operating equipment manufacturer with economies of scale and an expert level knowledge of the asset (Roy et al., 2009), (Wilkinson et al., 2009). End of life management is also left to the PSS provider (Isaksson et al., 2009). By combining product and service features, a PSS provider has the ability to tailor solutions that best meet the consumer's need and preference. This in turn can open additional revenue stream for the business and realize higher margins for more specialized solutions (Oliva & Kallenberg, 2003), (Cohen et al., 2006), (Tukker & Tischner, 2006b).
CH	Channels	Value propositions are delivered to customers through communication, distribution, and sales Channels	The retail interface is an important medium that both acts as a sales mechanism for the Value Proposition as well as a communication tool to promote PSS. When adopting a new PSS model, it is crucial to empower the sales team with the right information regarding the PSS system and the value it extends to the consumer over and above the conventional product-centric model (Tukker & Tischner, 2006b). As such, adequate training is especially important for the sales and marketing departments of the business, whose responsibility it is to sell and market the solution (O. Mont, 2000), (Tukker & Tischner, 2006b).
CR	Customer Relationships	Customer relationships are established and maintained with each	Relationships are key in business, none more so than the relationship with the consumer. In adapting to a PSS business model, greater emphasis is made on this relationship. This commitment to relationship

		Customer Segment.	development is a long term strategy towards retaining the patronage of the consumer (O. Mont, 2004), (Aurich et al., 2010), (Beuren et al., 2013). A number of strategies can be employed towards intensifying and solidifying the customer relationship by increasing collaboration in product development, information sharing and operational partnerships (Grönroos, 2007), (Gustafsson et al., 2010). Relationships can be adjudged on factors including trust, customer commitment and appeal (Grönroos, 2011a).
R\$	Revenue Streams	Revenue streams result from value propositions successfully offered to customers.	Revenue streams are the avenues through which a business can recoup financial gains from the provision of a value proposition to a consumer. In adapting revenue streams for PSS, the focus moves away from the one-time sale of an asset to the provision of diversified service and product combinations, which are supported by the long term relationships developed with consumers (Oliva & Kallenberg, 2003), (Cohen et al., 2006), (Tukker & Tischner, 2006b), Grönroos, 2011). Customizable service and product combinations diversify the revenue streams available to the business (O. Mont, 2000). The importance of long term relationships to revenue potential means that performance based revenue models need be applied for PSS models. Payment for product and service combinations can be based on factors including availability, use rate and productivity rate (Tukker, 2004), (Gustafsson et al., 2010).
KR	Key Resources	Key resources are the assets required to offer and deliver the previously described elements...	To support the PSS model, there is a need to develop and grow the necessary human resource capacity within the business to meet the service based demands of the model (Neely, 2008). Human resource training and competency development is necessary to ensure customer relationships are being maintained and leveraged for revenue maximization (A. Tan & McAloone, 2006), (Meier et al., 2010). With the consumer doubling up as a co-creator it is important that the necessary infrastructure exists to support cooperation between PSS provider and consumer (Meier & Massberg, 2004) (Grönroos, 2007), (Gustafsson et al., 2010).
KA	Key Activities	...by performing a number of Key Activities.	In adapting this business element for PSS, conventional product-centric thinking on the part of the business will have to be readjusted to focus on customer operations and service delivery. The PSS provider by way of providing asset and service combinations, participates in an interdependent relationship with the consumer, whereby the PSS provider services the core competencies of the customer. As an integral part of the customer's operations and core competencies, the PSS provider familiarizes themselves with their need and tailor makes a solution of product and service combinations that best fits that need. To meet the nuances of this tailor made solution and to maximize service delivery, the PSS provider must maintain asset monitoring capabilities through sensor technology to guarantee key performance indicators are met (Schuh et al., 2011), (Uhlmann et al., 2013), (Lelah & Brissaud, 2013). This monitoring and performance capability beyond ensuring reliability and uptime on the part of service provision, also means that asset maintenance and preventative servicing is data driven and therefore cost

			<p>effective. Through asset monitoring, the interdependent relationship between PSS and customer allows for pivoting, whereby the total offer of product and service combinations can be adjusted by the PSS provider to meet customer demand and strategic need quickly (Meier & Massberg, 2004), (Meier et al., 2010). By retaining ownership of the asset in service, the PSS provider undertakes operations that were previously the customer's responsibility including maintenance, cost control, invoicing and operations monitoring. In a PSS model the provider is also expected to expand their activities to include their customer's (Oliva & Kallenberg, 2003), (Cohen et al., 2006), (Tukker & Tischner, 2006b), (Grönroos, 2011a).</p>
<p>KP</p>	<p>Key Partnerships</p>	<p>Some activities are outsourced and some resources are acquired outside the enterprise.</p>	<p>No business is an island. To deliver on a value proposition, it takes a network of partners with diverse competencies, along a supply chain to provide the components necessary to create product and service combinations, that a PSS provider can take to market (A. R. Tan, 2010) (Vezzoli et al., 2015). The importance of developing and maintaining these partner relationships is crucial in PSS. In adapting this element for PSS, the business must first identify the network of partners within its supply chain and the competencies they bring to the relationship (O. K. Mont, 2002), (Chirumalla et al., 2013). The success and dependability of these relationships will have a direct effect of the PSS provider's ability to deliver on the value proposition (A. R. Tan, 2010), (Vezzoli et al., 2015).</p>
<p>C\$</p>	<p>Cost Structure</p>	<p>The business model elements result in the cost structure.</p>	<p>In managing any successful business cost management can be the difference between profitability and loss. A business model must strike a balance between the inherent costs of doing business and the ability to recover revenues from the market through correct pricing. Pricing is just as important in a PSS driven model (Sundin et al., 2009) (Erkoyuncu et al., 2011). Pricing out a combination of product and service elements requires the development of value based pricing models (Grönroos, 2011a). With the PSS provider maintaining ownership of the asset for its entire operational life, a number of accounting practices will have to adjust. The financial flows of the PSS provider will vary differently from a product-centric model where sales and therefore revenues are collected in lump sum at time of sale. In a PSS model, returns on investment a spread out over a longer period of time (O. Mont, 2004).</p>

3 Methodology

As outlined in section 1.2, the objective of this research is to develop a rental model for Volvo Trucks based on product service system. To build to this objective, the research questions focus on three key areas. Value proposition, Structure of the new off balance contract and how PSS delivers on Volvo’s sustainability mission. Each of these research questions complement one another in meeting the objective.

Table 3.1 below is a summary of the research questions and sub questions. To these the methods employed in addressing each individual research question is also outlined.

Table 3-1 Overview of Research Questions and Applied Methodology

Research Question	Methodology
<p><i>What are the key attributes of a business model built in line with the PSS ideology and compliant to the provisions of IFRS16?</i></p> <p>What criteria will the new contracts need to meet to be considered off-balance sheet as defined in IFRS 16?</p> <p>What is the structure and logic of the new off-balance contracts?</p>	<p>Literature Analysis</p> <p>Interviews with Rental Managers</p> <p>Interviews with clients</p>
<p><i>What is the new customer value proposition in light of the IFRS 16 changes?</i></p> <p>What factors influence a rental decision?</p> <p>What bundled services are necessary for supporting the rental contract</p>	<p>Literature Analysis</p> <p>Interviews with Rental Managers</p> <p>Interviews with clients</p>
<p><i>How does Volvo Trucks relate to sustainable development aspects in the new value proposition model?</i></p> <p>What products and services can be bundled together in the lease to deliver environmental savings?</p> <p>How can Volvo promote the uptake of best available technologies to its customers?-</p>	<p>Literature Analysis</p> <p>Interviews with Rental Managers</p> <p>Interviews with clients</p>

3.1 Literature Analysis

The application of this method involves the collective analysis of literature from varying sources. These sources include peer-reviewed academic journals, grey literature, white papers and reports. The literature analysis first sets the basis of the research by seeking to identify how product service system can deliver on the customer value proposition. Additionally, the literature analysis also highlights the manner in which product service systems can facilitate sustainability within a business model.

IFRS 16 regulations have a catalytic effect on businesses and the manner in which they operate and access leasing solutions. Understanding the effect that these changes have on lease reporting gives scope to the challenge that Volvo Trucks has in providing rental competitive rental solutions for its customers. More so for lessees, the IFRS 16 regulations significantly alters how they report leases. IFRS 16 sets the scope of the types of businesses and industries that will be affected. Only customers that fit that profile will be analyzed.

IFRS 16 makes distinctions between what qualifies as a lease and as service. The law stipulates what criteria qualifies a rental agreement as a lease - and therefore on balance sheet. As discussed in Chapter 1, services are considered off balance sheet items under the regulations.

With the service based context developed by IFRS 16, a focus on a service driven business model becomes necessary to fulfill the objective of this research. Product service systems are defined and analyzed in Chapter 2, whereby the connection between product service systems is made with the objective and problem definition of this thesis. As such, guided by the analytical framework established in Chapter 2, a Use Oriented product service system model is applied as the scope for the service based business model.

The key characteristics of use oriented, product service system models are discussed and argumentation on how it addresses the problem of off balance sheet transportation solution access under IFRS 16. The sustainability potential of a use oriented product service system is investigated to establish how it can complement Volvo's sustainability mission.

3.1.1 Identifying the customer segments

Identifying customer segments is a prerequisite to developing a customer value proposition. The customer segments are indicative of the markets that Volvo Truck operates in.

The process of identifying the market segments is conducted in two complementary ways.

- Utilizing market intelligence reports: - These are internal company reports focused on Volvo's key rental markets.
- Interviews with rental managers: - These are the managers responsible for the rental operations in specific Volvo Truck markets.

Interviews with rental managers were sourced from various markets including Sweden, Finland, Denmark, Czech Republic, United Kingdom and United States of America. The market intelligence reports were key in identifying the size of Volvo's market share in these countries as well as specific information on the size of the various market segments that Volvo targets. With their customer relationships, rental managers have an in-depth understanding of their customers and the unique requirements of their industry.

The market segments identified from this process are summarized in Table 3-2 Overview of Market Segments and Description below.

Table 3-2 Overview of Market Segments and Description

Market Segment	Description
Distribution Trucks	These are trucks utilized within an urban environment such as a city.
Long Haul Trucks	These are trucks that operate over long distances utilizing highways to connect distant cities.
Construction Equipment	Specialized machinery to fulfill specialized processes.

3.1.2 Criteria of customers

Building up on the 3 market segments that this study is focused on, it is important to understand the criteria of the specific customers within this segment that are affected by IFRS 16. A criteria list of the customer criteria is developed on two key elements.

1. Scope of IFRS 16 - The jurisdiction of those covered by the regulations in the European union is defined in the European Union’s 2002 adoption of the IFRS Standards which required financial reporting standards for the consolidated financial statements of all European companies whose debt or equity securities trade in a regulated market in Europe, effective in 2005. The adoption of IFRS Standards was done by enactment of Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards (known as the Accounting Regulation) (IFRS, 2016a).
2. Customers with operations in more than one of Volvo’s key rental markets that are utilizing truck rentals in their fleet. - This is necessary to establish statistical relevance from the views garnered from such customers due to their geographical reach and buying capacity. Customers with a previous or current rental history are better placed to give perspectives on their consumer preference.

The customer criteria identified from this process are summarized in Table 3-3 Overview of customer criteria and description.

Table 3-3 Overview of customer criteria and description.

Customer Region	Geographical	Ownership	Segment
European Union and Global		European companies whose debt or equity securities trade in a regulated market in Europe.	1. Distribution Trucks 2. Long Haul Trucks 3. Construction Equipment

3.2 Interviews: Developing the customer Value Proposition

Developing a base knowledge of the truck rental process was crucial prior to making contact with customers. To develop this base knowledge, interviews were sourced from rental managers from a number of diverse markets, whose main responsibility was to manage the rental operations within these geographical regions. The interview process is summarized in Table 3-4 Overview of interview process for rental managers.

Table 3-4 Overview of interview process for rental managers.

Step	Process	Result
1	Introduction and brief on thesis topic	Development of rapport and establishing the scope of the study.
2	Semi Structured interviews	Interviews structured to understand: The role of the Rental Manager The size and importance of markets. The Rental sales process Current value proposition
3	Contact Request	Request for customer contacts that meet criteria established in table 4.2 and 4.3 respectively. Rental managers are well versed on their clients. I leveraged this relationship to secure interviews.

The customer interview process is summarized in Table 3-5 Overview of interview process for customers below.

Table 3-5 Overview of interview process for customers.

Step	Process	Result
1	Identify the scope of IFRS 16.	IFRS Standards which require financial reporting standards for the consolidated financial statements of all European companies whose debt or equity securities trade in a regulated market in Europe (IFRS, 2016a)
2	Understand Market segments	Distribution Trucks Long Haul Trucks Construction Equipment
3	Identify specific clients from each market segment that are subject to IFRS 16 reporting and that utilize rental fleets.	Interviews booked with 3 clients
4	Conduct interviews with purchasing managers.	3 x1 hour interviews
5	Data Analysis	What are the individual needs of each segment/business
6	Creation of customer value proposition	Utilizing the business model canvas map out Pains vs Gains and how the value proposition addresses each.

An interview guide was developed to facilitate the semi-structured nature of the interviews. Being the core facet of the value proposition, customer interviews were considered expert interviews. The semi-structured nature of the interview guide allowed for flexibility and was modified to reflect the interviewee's familiarity with the subject matter as well as the unique business operating conditions of their firm. Though

a detailed interview guide is included in the Annex section, below in Table 3-6 Overview of Customer Interview Sections and Details.

Table 3-6 Overview of Customer Interview Sections and Details.

Section	Details
Core Competency	Questions directed at understanding the customer’s business and the environment in which they operate in.
Capacity Utilization	Questions directed at truck use. Use patterns and demand.
Leasing Preference	Questions directed at understanding the business argumentation for leasing and the importance of off balance solutions. Questions directed at establishing what bundled services will constitute the total offer.

Facilitated by the rental managers, appointments were booked between July and August 2016. The rental managers were the first to establish contact with the customers, briefing them about the nature of my request and the scope of the discussion. The interviews were conducted over the phone and detailed notes taken during the discussion.

3.3 Rental Contract Development

Leasing contracts are the key executing documents that will allow for transportation delivery service from Volvo Trucks to its customers. A rental contract is a key deliverable and goal of this thesis. The driving objective of this contract is to deliver an off the balance sheet solution. Below is Table 3-7 Overview of rental contract development process.

Table 3-7 Overview of rental contract development process

Step	Goal	Task
1	Identify the scope of IFRS 16.	Identifying how IFRS 16 defines rental contracts.
2	Moving from product centered to service centered.	Defining what a service is Under IFRS 16 and create the distinction with the new proposed rental contract
3	Defining capacity	Input from rental managers Input from customer interviews
4	Structure of the new capacity based rental contracts	Structuring a contract by using the current rental contract as a template and modifying it meet the new capacity based measure
5	Determine the total offer	In addition to rental capacity, developing the total contract offer by utilizing Input from rental managers Input from customer interviews
6	Pricing the total offer	Determine pricing strategy for new total offer.

Scope of IFRS 16 on lease contracts

Under IFRS 16 leases are established on two key principles:

1. Identified Asset
2. Right to control use of the identified asset.

These are summarized below in Table 3-8 Overview of rental contract principles under IFRS 16 (EY, 2016).

Table 3-8 Overview of rental contract principles under IFRS 16 (EY, 2016)

Principle	Criteria 1	Criteria 2
Identified asset	No substantive rights to substitute	No benefits from substitution
Right to control use of the identified asset	Right to obtain substantially all economic benefits	Right to direct the use of the asset

Under IFRS 16, a lease is considered on the basis of these two principles. Therefore, for the new rental contract to be truly a service and therefore off-balance, its structure must not match with the regulation's definition of a conventional on balance sheet lease.

The principles of the new capacity based rental contracts must therefore in principle be:

Table 3-9 Overview of proposed principles for off balance capacity based contract.

Principle	Criteria 1	Criteria 2
Capacity specific and not Identified asset specific	Substantive rights to substitute exist in contract	Financial and operational benefits from substitution
Right to control use of the identified asset	The lifetime economic benefits of the assets used to deliver rental capacity	Contractual rights to monitor the use and deployment of assets when servicing contracts.

Contract structure development process.

To develop a new contract to match with the PSS based business model the structure of the contract is developed in two main areas.

1. **Key Contractual areas** - These are the clauses of agreement contained within the rental contract that spell out what is being leased, by whom, for how long and at what price.
2. **Terms and Conditions** - These are terms and conditions agreed upon that make the contract binding between Volvo Trucks and the lessee.

To deliver on the objective of producing an off balance sheet rental contract, the development process is summarized below in Table 3-10 Overview of Contract structure development process .

Table 3-10 Overview of Contract structure development process

Task	Goal
1	Acquire a current rental contract from the rental manager and mock up its structure
2	Determine the capacity measure and the clauses it affects in the modern contract. Capacity measure for each market segment is determined by interviews with rental managers and customers. Include the details of the total offer derived from customer interviews.

3	Utilizing finding from the literature review, develop terms and conditions that are necessary in supporting the contract.
4	Produce mock-up contract with terms and conditions.
5	Produce final copy of contract structure

3.3.1 Sample of off balance sheet contract

To meet the objective of this thesis, the structure of an off balance sheet rental contract will be produced with its accompanying terms and conditions. The sample contract will be included in Chapter 5 of this thesis.

4 Findings

In this Chapter, the results from the methods of analysis are presented from interviews with relevant stakeholders and from a literature analysis to determine the structure of the sustainable PSS business model, providing off balance sheet capacity leases. The results herein allow for the analysis to determine the answers to the research questions presented in Chapter 1.

In guiding the analysis of results, the analytical framework defined in Chapter 2 is utilized. That framework is shown below in Figure 4-1 Overview of the 3-step framework to support adoption of a PSS business model.

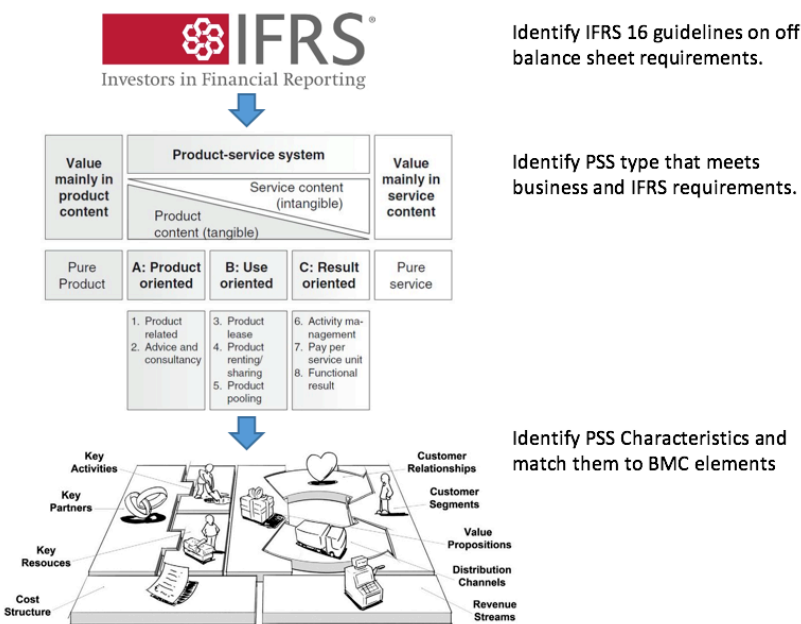


Figure 4-1 Overview of the 3-step framework to support adoption of a PSS business model.

The analysis of findings is guided by first identifying the threshold IFRS 16 sets on off balance sheet classification. The second step in following with the framework will be to identify what Product Service System classification best meet the threshold of off balance sheet identified in step one. Step three, the final step in the analytical methodology involves utilizing the Business Model Canvas to identify the 9 key elements that make up a PSS centered off balance sheet lease business model. This analytical framework will be utilized in the analysis of literature and interview data.

4.1 Findings from Interviews with Business Model Stakeholders

The bulk of the data collected relied on interviews with various stakeholders to determine the structure of the new Sustainable PSS business model. Initially it was thought that a survey could supplement the interviews however that proved difficult to conduct. The challenges around this will be discussed in the reflections chapter. 12 detailed interviews were conducted with various stakeholders including customers to elicit answers in 3 key areas, IFRS 16 and qualifying off balance leasing, The PSS structure of the business

model supporting the value proposition and the sustainability potential of the PSS business model.

4.1.1 IFRS 16 - Qualifying for Off Balance Leasing

IFRS 16 is the catalyst behind Volvo Truck's ambition to offer off-balance leasing solutions to its customers. Due to the complexity around the law change, views regarding the regulation and the means by which to provide off-balance leasing were sought from three key sources including: Volvo's IFRS Specialist, Volvo Construction Equipment's Business Control Planning and Volvo Transport Solutions.

These stakeholders either work directly with the regulation or have recently had experience in providing off balance sheet solutions to their customers.

In summarizing the IFRS 16 regulations and the provisions therein that allow for off balance sheet leasing, Sofia Lundquist, Volvo's IFRS Specialist brings up the issue of **identified asset** and **substantive right to substitution** as presented in the regulations. She states,

If there is so to say an identified asset - that's what it says in the standard, then if there is one particular truck in this case then you say that this is a lease. But if there is a possibility within Volvo for us to change that truck without any extra cost I think it says, and the lessor won't notice any difference, then we are more into service. So we don't need to end up on the balance sheet for the customer...So a lessee doesn't control the use of an identified asset if the lessor, Volvo, has substantive right to substitute the asset (Lundquist, 2016).

In understanding how other divisions within The Volvo Group approached the two issues of identified asset and substantive right to substitution, discussions were held with Volvo Construction Equipment who are currently in a tender process for a 'Power by the hour' contract. These are capacity based contracts that are designed to be off balance sheet. Jean-Thomas Cock the business analyst on the tender noted.

REDACTED (Cock, 2016).

In approaching the issue of off balance solutions, VCE considered two additional criteria specifically, **length of contract** and the **separation of the asset from the leasing company** to meet the regulation around the identified asset requirements. Cock further states,

REDACTED (Cock, 2016).

The interviews determined that to meet the IFRS 16 requirements, the lease is required to be less than one year in length. However, if truly designed as a service, Volvo Trucks would need to prove a substantive right over the asset, with the ability to substitute the asset. To this the IFRS specialist notes,

So a lessee doesn't control the use of an identified asset if the lessor, Volvo, has substantive right to substitute the asset. And that substantive right is that the lessor has the practical ability. I think you don't notice if you have a red truck or a blue truck. It does do the same work. But the question is, would we be able to benefit economically from this. That's the key here I think. If we fulfill this requirement, then it will be a service instead of lease accounting. This is where I think we have the biggest possibilities (Lundquist, 2016).

4.1.2 The Customer Segment

The customer segment refers to the target group within the market that Volvo engages in order to deliver a value proposition. Mikael Lidhage a transport solutions manager shared in his interview:

I think that's where the initial requests will come from. I think the bigger customers will be much more cautious about their balance sheet and how that looks. I think for an owner operator that doesn't really matter. But for sure its going to start with the big customers and its more of a solutions based sales approach but we need to be efficient in providing those ones and not reinventing new ones every time we meet the customer. We need to be much more clever at selling and also delivering in the sense that it will require capabilities from us (Lidhage, 2016).

Speaking to Volvo Construction Equipment at Volvo Group their experience pointed to larger commercial enterprises that are publicly listed as the biggest customer segment in this business model.

REDACTED (Cock, 2016).

In summarizing the customer segment, interviews revealed that the larger transport buyer are the most affected. **Specifically, larger commercial operations that a publicly traded. These are covered by the scope of the IFRS 16 regulation and therefore face the most pressure in accessing off balance sheet capacity leasing solutions.**

4.1.3 The Customer Value Proposition

The customer value proposition in this case relates to the value Volvo Truck's is able to create and monetize from its customers. In this regard, the interviewees were sourced from a broad spectrum of stakeholders both internal to Volvo's organization as well as with customers to determine what service the consumer required of off-balance contracts.

To develop an understanding of what the Value Proposition is for customers seeking off balance sheet leasing solutions, a conversation was held with VCE who are currently working on a tender to supply off balance sheet capacity or power by the hour leasing for one of VCE's key clients.

In discussing the value proposition, the analyst notes,

REDACTED (Cock, 2016).

In bringing forward the main selling points of an off balance solution, the discussion brings up the financial benefit of off balance leases. In this case, **balance sheet debt pressure and high capital expenditure are significant pains for the client and are driving the demand.**

In further discussing this point the interview continues with Lars-Ola Sjöström, the Director of Product and Service Development, responsible for the off balance lease offering at VCE. In further discussing the position of the market and for the demand around off balance sheet rental contracts, he states,

REDACTED (Sjöström, 2016).

Demand driven by the anticipation of IFRS 16 means that customers are seeking solutions that not only bolster their financial position, but that also enhances their core competencies. In discussing the solution that these off balance sheet capacity based contracts offer to meet these two goals Sjöström continues,

REDACTED (Sjöström, 2016).

The value proposition key benefits are therefore twofold. A capacity based leasing contract on a **financial level relieves the debt burden of customers while at the same time eliminating the fixed costs associated with truck ownership.** In terms of capacity and its influence on the customer's core competency, **the goal is to deliver uptime, which has a direct influence on the consumer's core competencies.**

Having developed an understanding of the scope of the law and how other divisions within Volvo approached the design of the value proposition, three in depth interviews were carried out with key rental customers in Volvo's portfolio that would be affected by the IFRS 16 regulations. Interviews were set in place to gauge their preferences in off balance capacity based solutions.

In speaking to Mr. Torben Hansen at Arla foods he summarized the importance of the financial benefit of off balance sheet capacity based contracts as follows:

It would be rather important to us. so it would be a four on a scale to 5 (on importance for us to access off balance solutions.) We need to spend our Capex on building dairies, stainless steel pipes. not trucks. it all depends on cost and price (Hansen, 2016).

On the nature of the service, Martin Svedin at Bring states,

...I would say that you'd focus on certain parts of our business. Maybe not the short kilometer distribution trucks that are very specialized - low, short, double compartment and everything. But if you were to go with, for example we have 4 different trucking companies within Bring in Sweden. We would say that 80% of the trucks are standard long haul trucks with a trailer and a dolly. I know for example the trucks that go from Stockholm to Gothenburg and from Helsingborg and Malmo to Stockholm and back that's pretty standardized. And we know months in advance how many trucks we will need on a standard base and how many we need - for example so seasonal as on a Thursday. Because between Wednesday and Thursday, there can actually be 20% more trucks needed. And we know that for one company that in one day they are very high in volumes. So I would say in those divisions where there are standardized trucks you could be quite good at. We've got something like this with the tires where we do a kilometer agreement with Volvo for driven kilometers on our tires. We signed that contract with Volvo but it's with both Volvo and Scania. So they actually manage our tires and Scania also (Svedin, 2016).

On discussing the business influence these capacity based contracts have on the customer's core business Svendin further states on the nature of the value proposition expected,

... I have a tire to roll on and not my tire, but a tire I can roll on...If it's the right equipment and the right cost and I feel that it's a consistent cost over the period that I use it or the kilometers that I use it or anything. Its likely that I will choose that model. If I were to look at, if there was a term within that lease that said you had to drive it for 80% or you get billed for non driven kilometers that would limit me in my choices. But if you have a certain amount that's on contract, for example you say 1 million kilometers a year and the equipment is right, that would be a good service to us. That would be very good.

What's been my core value always has been to sign agreements on everything on the truck. I don't leave anything out. My service agreement is 100% covering the truck's technology its covering everything from the auto-lock to the tailgate lift to calibrating - its including 100% of the truck's equipment so that I know what my cost is for the coming 3-5 years ahead. I don't want to have any guesses on what it's going to cost

me if it isn't a driver error. When the driver hits something and the truck gets damaged I have insurance. So I know any damages on the truck that are below SEK 10,000 that I pay for myself. Any higher it goes on the insurance or the Volvo contract (Svedin, 2016).

In addressing the issue of Volvo's substantive right over the asset and the company's ability to substitute the asset was also addressed as part of the value proposition. To this Svendin responded,

I actually talked to Anders regarding the 35 trucks that we bought from him. Because those are on a 3 year lease and neither he or I can see the value of getting 35 trucks back the 3rd of October in 3 years. We want to have a floating limit saying we will get it. Every year we will look at the kilometers we look at the usage of the truck and we say, 5 of the trucks aren't going to be worth that much money after 3 years. They've done so much mileage. If there is a possibility for Volvo to sell them in 2 years and deliver me a new one, I don't care. It's better for me if I get a new one (Svedin, 2016).

In summary, the results of the value proposition interviews revealed that the main driver to secure off balance sheet capacity leases are mainly to limit the capital expenditure of the customer away from non core assets such as trucks. Additionally, larger Volvo customers are also seeking to limit the debt burden on their balance sheet. In regards to the solution itself, capacity contracts based on miles driven allow the customers to eliminate the fixed costs associated with asset ownership, allowing them to direct capital expenditure to production. The variable costs would be directly proportional to the use of the asset.

In regards to Volvo's substantive right to substitute, objections weren't raised. If well planned, the respondents didn't care about what specific truck was used, rather more about the productivity of the asset.

4.1.4 Channels

As a business element, channels support the manner in which the value proposition is delivered to the customer. In this regard, interviews were held with stakeholders within Volvo to determine how best to deliver the value proposition to the customer. Views particularly within VCE were especially crucial as they had specifically worked on an off balance capacity leasing solution as part of a tender process. Mikael Lidhage a Transport Solutions Service Manager at Volvo expressed:

Of course you need to listen to the customer and to see what their needs and their demands are. I think that's normally enough when you talk to a customer about a more traditional normal deal. But when you talk to a customer in instances like this, we are not talking about even 10 trucks. Its a much bigger operation in scale normally and its not enough to just sit down with them. You probably need to include some site visits where these trucks are going to operate and what are the conditions. Because we are taking on a great part of the risk we need to understand the risks and price it accordingly. We need to understand the customer requirements and can we do something beyond what they are asking us to deliver. Can we help them to streamline their operation in a sense so that we can optimize it and not just provide what they are asking for. We need to apply a slightly different approach and more of a solutions sales approach. I think. At least in the bigger cases that we have been involved in and also what I see, that would be your owner operator asking for this. It will be the bigger more sophisticated demanding customers. So that would require more of a solution sales approach where you get a much deeper understanding of the customers and their demands (Lidhage, 2016).

The approach taken by Lars-Ola Sjöström with VCE was similar when determining the best channels to deliver the value proposition during the sales process.

REDACTED

Findings from the interviews revealed that due to the complex nature of these capacity based contracts and coupled with the resource intensity and coordination required to deliver the service, **the sales process is best coordinated through key account managers. The sales process is leveraged through the customer relationship with a solutions sales strategy.**

4.1.5 Customer Relationships

Customer relationships are the basis of any successful business venture. For Volvo Trucks, customer relationships are leveraged both to understand the need of the customer as well as to deliver on the value proposition.

Lidhage adds:

I think there are different things that need to be changed. I think one is how you manage the customer relationship. Since it is quite complex because you have different parts of the offers supplied by different parts of the organization perhaps into one sort of solution in a sense. That will require more coordination both when it comes to providing the different components and to monitor the delivery but also to monitor the customer relationship from a sales point of view. There will be different levels from a local dealer to a market company to a central function that will also increase the complexity at least from when its these type of players. and usually demand is more global and it is required of a global company approach sometimes... Not necessarily HQ but at least some sort of key account approach. Whether a national level or an international level I think depends on the size of the customer (Lidhage, 2016).

In adding to how a PSS business model leverages customer relationship Lidhage further adds:

Since we are talking about the bigger more complex customers then it will involve a Volvo meeting with the customer. Its more of a project sales approach and not a retail sales approach which is different (Lidhage, 2016).

Indeed, part of the value proposition presented by VCE as part of their tender proposal is the leveraging of this customer relationship in its practicality. The analyst at VCE noted.

REDACTED (Cock, 2016).

The customer relationship becomes exceedingly important within this PSS Based capacity based lease arrangements. Given that the nature of customers affected by IFRS approach **are larger multinationals, relationships with customers must be leveraged both as a means to secure business but also as a means to ensure that service delivery is met.** Results from the interviews showed that **a project sales approach as opposed to a retail sales approach should be applied in the business model.** The business model calls for the coordination of Volvo's organization in monitoring the customer relationship. **It calls for the coordination and development at a national or international level with delivery on the relationship promise occurring on the ground with local dealers and market companies.**

4.1.6 Revenue Streams

Revenue streams are the financial avenues through which Volvo Truck's can elicit financial gain as a result of successfully meeting the need of the consumer through the value proposition. The revenue is directly tied to the value proposition around the capacity based lease contracts.

Interviews with VCE revealed

REDACTED (Sjöström, 2016).

In drawing a distinction to how revenue streams differ between the current business model and a PSS based business model focused on capacity based leases, Lars-Ola Sjöström notes,

REDACTED (Sjöström, 2016).

Revenue Streams are dependent on the nature in which the contractual agreements around the capacity based contracts is made. The revenue model is subject to the performance metric of the contract and the bundle of the service offerings around the value proposition

REDACTED (Cock, 2016).

Lars-Ola Sjöström notes that the terms and conditions around the performance and use of the contract are critical in determining revenue. Of performance based contracts he states,

REDACTED (Sjöström, 2016).

Jean-Thomas too notes,

REDACTED (Cock, 2016).

Performance based contracts though present a downside to Volvo's revenue ambition. In power by the hour contracts, if capacity is un-utilized, the customer doesn't pay a fee. However, Volvo still bears the fixed costs of owning the asset. To this point the issue of use minimums is brought up during the interviews.

REDACTED (Sjöström, 2016).

Further on Volvo's revenue risk and how contractual terms can assist in hedging it, VCE analyst Cock notes,

REDACTED (Cock, 2016).

Sjöström however observes that forward thinking when formulating the terms and conditions around use can prevent an unsustainable revenue position. In addition to protections around contract termination, issues of practicality and the strength of the customer relationship are key drivers in ensuring that contract terms are adhered to.

REDACTED (Sjöström, 2016).

In summary, the interviews with Volvo stakeholder revealed a number of key points relating to the revenue element of the business model. The **capacity based lease contracts are best designed by utilizing a trend analysis of past use to ensure capacity budgeting is cost effectively measured. Pricing argumentation is based on fulfilling capacity uptime and monetizing the additional packaged services that come the capacity contract. Revenues are maximized when selling solutions.** Over and above the conventional business model, the revenue potential of a PSS capacity based

leasing model is significantly higher. **Capacity based contracts have more turnover potential as the customer's business is kept within the business eco-system.** The negotiation of contractual terms to protect Volvo's revenue potential needs to address the issue of **minimum usage as well as the pricing around flexibility and protections against contract termination.** The pricing strategy is about quantifying the risk and pricing the service on a **customer to customer** basis.

4.1.7 Key Resources

Key resources refer to the assets necessary in delivering on the Value Proposition. In the case of Volvo Trucks, it refers to the trucks used in delivering the value proposition.

A key concept related to key resources was outlined in IFRS 16 relates to the substantive right to substitute and the issue regarding the ownership of the asset. In discussion with Volvo's IFRS specialist on these two issues revealed,

In this new lease standard there is a distinction between what is service and what is lease...The question here is, what are we offering to the customer in this rental business? Are we offering them one truck that they can use for 5 years or are we offering them the possibility to transport something from point A to point B on whatever truck. That might be more of a service.

If there is so to say an identified asset - that's what it says in the standard, then if there is one particular truck in this case then you say that this is a lease. But if there is a possibility within Volvo for us to change that truck without any extra cost I think it says, and the lessor won't notice any difference, then we are more into service. So we don't need to end up on the balance sheet for the customer...So a lessee doesn't control the use of an identified asset if the lessor, Volvo, has substantive right to substitute the asset. And that substantive right is that the lessor has the practical ability. I think you don't notice if you have a red truck or a blue truck. It does do the same work (Lundquist, 2016).

The uptime, meaning the available hours of use on the asset is crucial. Asset management is a crucial element as it relates to this business model. Interviews with VCE revealed,

REDACTED (Sjöström, 2016).

In discussing the solutions with the customers, interviewees revealed their preference for how these assets could be utilized within their fleet through the capacity based contracts.

Martin Svedin at Bring expressed,

And I would say that you'd focus on certain parts of our business. Maybe not the short kilometer distribution trucks that are very specialized - low, short, double compartment and everything. But if you were to go with, for example we have 4 different trucking companies within Bring in Sweden. We would say that 80% of the trucks are standard long haul trucks with a trailer and a dolly. I know for example the trucks that go from Stockholm to Gothenburg and from Helsingborg and Malmo to Stockholm and back that's pretty standardized. And we know months in advance how many trucks we will need on a standard base and how many we need - for example so seasonal as on a Thursday. Because between Wednesday and Thursday, there can actually be 20% more trucks needed. And we know that for one company that in one day they are very high in volumes. So I would say in those divisions where there are standardized trucks you could be quite good at... If it's the right equipment and the right cost and I feel that it's a consistent cost over the period, that I use it or the kilometers that I use it or anything. It's likely that I will choose that model (Svedin, 2016).

In summary, the results of the Key resources showed that as a conduit for service delivery, **the asset in abiding with IFRS 16 regulations remains the property of Volvo**

Trucks, who possess a substantive right to substitute the truck at any time during the contract period. The asset is used to deliver the uptime that the customer is paying for. Uptime is the available working time on the asset that the customer can readily utilize and that Volvo can bill for. **Taking into account the substitution rights available to Volvo, standardized truck specifications over standardized fleets appears to be the strategy most resonating with customers considering capacity leases.** Where data gaps exist in the business model is on cost, which is discussed separately.

4.1.8 Key Activities

Key activities in the business model are the operations that support in the delivery of the value proposition by utilizing the available key resources.

The key activities around how to best support the business model are often times defined by the scope of the contract and need of the customer.

REDACTED

Though in some cases the customer may have pre-defined expectations of the service that they require, Volvo is still responsible for putting in place terms and conditions to facilitate the management of the asset during deployment. Mikael Lidhage Volvo's transport solutions service manager notes,

I think there are different things that need to be changed. I think one is how you manage the customer relationship. Since it is quite complex because you have different parts of the offers supplied by different parts of the organization perhaps into one sort of solution in a sense. That will require more coordination both when it comes to providing the different components and to monitor the delivery but also to monitor the customer relationship from a sales point of view. There will be different levels from a local dealer to a market company to a central function that will also increase the complexity at least from when its these type of players. and usually demand is more global and it is required of a global company approach sometimes... Not necessarily HQ but at least some sort of key account approach. Whether a national level or an international level I think depends on the size of the customer.

What I do is to support the markets when it comes to making sure that they can sell and deliver the transport solutions services in the best possible way. So its more of a business development support for the markets, trying to set appropriate targets and for support to reach appropriate targets in selling our transport solutions services. Dynafleet, fuel advice, service contracts, financing, rental and driver trainings and consultancy services.

If you talk specifically about the weight depending on the type of truck you can monitor remotely. Some specific applications might require the set up of monitoring depending where it is. If its a low cost market, then it can be an interesting alternative to put the person there. Its a matter of cost. What means you have to monitor.

But there are cases where it makes sense for us to demand that the customer for instance puts their drivers through driver training and that we have telematics service to follow the performance of the driver. Just to mitigate and to control that risk. Whether we price that as a value service or if we see it as a cost in providing a service we price it depending on customer to customer (Lidhage, 2016).

Performance based contracts specifically have performance related clauses that require for the asset to be monitored during deployment to guarantee uptime. Monitoring is carried out utilizing connectivity hardware and software on the Truck. As part of the packaged solution, Volvo to spread risk, would require Dynafleet to monitor the uptime and performance of the contract.

The requirement of monitoring and telemetry services allows for additional bundled services to be packaged as part of any capacity contracts. Monitoring specifically is necessary to ensure that the asset is being properly utilized as per the contract. Additionally, the Dynafleet hardware utilized for this element can also be used in driver training and fuel advice, which allows Volvo to bolster its environmental value proposition as well as saving the customer money on fuel, which has the biggest impact on the customer's variable costs.

Mikael Lidhage Volvo's transport solutions service manager notes,

First of all, the environment is one of the core values of Volvo. Of course it is important. But again, how it comes into a business discussion is dependent on the willingness of the client as well. Of course with the trucks we try and make them as environmentally friendly for the application as possible. That's what you get when you choose a Volvo. But then again with Dynafleet you can follow the emissions and you can reduce consumption by training drivers and following up on our services. And consumption and emissions from that perspective have a one to one relationship. So from that point of view we have offers that can help our customers. At the end of the day there needs to be someone that is willing to pay and set the requirements. And we see that more and more (Lidhage, 2016).

Further discussions on how monitoring hardware and software can be used to optimize customer operations and minimize fuel use came up in discussions with Mikael Börjesson, a Volvo manager responsible for fuel advice.

A lot of reports on Dynafleet are following up on the fuel consumption and also driver behavior. The biggest difference between fuel advice and Dynafleet is that in fuel advice it's more of a consultancy service. So the customer will get prepared reports with analysis and advice for the drivers on how to perform their driving to achieve a lower fuel consumption. It's not a Dynafleet service. It's not considered a Dynafleet service. But Dynafleet is required on the truck. Of course they are logging the parameter, the data that we pick from the truck. It comes from Dynafleet. When we calculate fuel advice we get the reports.

The service consists of three parts. The fuel advisor - the person who prepares the report and sends it to the customer and is also the support for the customer and guide whenever there are questions they can turn to that fuel advisor. There is also a toolbox where the customer can find some information about fuel efficiency in general. About truck features in general. Just to understand what fuel consumption is about and how to approach the lowering of the fuel consumption. Because we claim that this is very much a change management thing. Fuel advice or lowering fuel consumption is very much to tell the driver this is tracked and you should do this and that and then we follow up on that. And if the drivers are taking the information and changing we will see the result from it. It is very much a process. Then to do that on a regular basis and to see when old habits are coming back. Because I would say that any driver could improve his fuel efficiency. 1-2% or up to 10, 15, 20% depending at what level you start.

And this is what I was talking about. Without follow up we have a level of fuel consumption, then we make an improvement from the training. And we see a result, but we also tend to see that often without following up, they tend to go back into their old behavior. So that's where fuel advice goes in. If we provide feedback and follow up with drivers after training or as part of a longer program I claim, start with the training and continue with the follow-up. Then you will gain better and sustainable improvements. As long as the drivers follow the recommendations of course (Börjesson, 2016).

In summarizing the key activities necessary in supporting Volvo's new business model, results point to **a solutions based sales approach that requires the coordination of various resources within Volvo to deliver on the value proposition.** When it came to optimizing service delivery, results showed that **monitoring was an essential operation for Volvo to carry out. The monitoring of the asset utilizes telemetry information from the truck, collected by software and hardware components installed in the truck known as Dynafleet.** In addition to allowing Volvo to monitor and optimize the

operations of the asset, Dynafleet allows for ride on services that include fuel advice and driver training to be offered to the customer as part of the value proposition. Diver training and fuel advice are two ways which Volvo can bolster its sustainability offering to the client while also reducing the customer's variable costs on fuel.

4.1.9 Key Partnerships

Key partnerships refer to those relationships that Volvo has to maintain with value creation partners in order to deliver the value proposition.

In Volvo's bid to provide all inclusive capacity contracts to customers, certain partnerships will need to be strengthened and developed to ensure the value proposition is met.

Conversations with customers revealed,

We signed that contract with Volvo but it's with both Volvo and Scania. So they actually manage our tires and Scania also... We have an agreement with a Volvo retailer and reseller in Sweden. The contract was taken over by Volvo a couple of months ago. Where we have Dynafleet in our trucks - the telematics system from Volvo. They go into our system and they give the billing department with the kilometer report from all our trucks. The first of every month and they send an automated report back to us saying this is how many kilometers you are supposed to bill for what you've been driving last month. Basically its an invoice on actual kilometers. There isn't any guess or any tariffs or anything. These are the actual real kilometers we have driven. And then we multiply that by the price per kilometer on the tires, it's actually backed up by Bridgestone in this case. Where Bridgestone actually guarantees Volvo and me a certain amount of kilometers on a tire. So they say on front tire you should do 20,000 Swedish miles. On the back you should do 19,000 on the driving axle you should do about 25,000 Swedish miles. And if the tire is worn out before that, Bridgestone is the billing part. Volvo has an agreement with them that they get a deduction in price if the tire doesn't keep up for as many kilometers as they said. And we have to once a year get an axle adjustment on all our trucks. We go into a garage and we set the axle straight we've done everything for the possibility to roll 20-25,000 Swedish miles. So its been working quite well for us. We've had it for two years now. And when you go into the contract Volvo mentions how many millimeters of tire we have on each truck and that goes into a tire fund for us. So we have a stipulated amount of tires. So if we were to break the contract and leave the contract, we have a certain amount of kilometers with us in the agreement and a the same amount of millimeters going out of the agreement (Svedin, 2016).

When packaging solutions for customer's results revealed that certain elements are sourced from partners within the value chain. **Volvo in its case needs key partnerships in component suppliers and truck body builders to supply the Value proposition.**

4.1.10 Cost Structure

Cost structures are described as the inherent risks faced by Volvo Trucks as part of delivering the value proposition to the customer. With the experiences drawn from VCE it becomes necessary to be able to calculate and account for the risk.

Interviews revealed,

REDACTED (Sjöström, 2016).

In addition to developing the necessary competencies around maintenance and upkeep of the asset during deployment, the issue of residual risk has an adverse effect on how competitive the bidding is for power by the hour contracts,

REDACTED (Sjöström, 2016).

However, the success of any model is about being able to capture the risk and pricing adequately.

REDACTED (Sjöström, 2016).

In summarizing the cost element of the business model, **Volvo trucks must develop the competencies around the management of the asset.** This involves being able to **price the cost of operating the asset as well as the debt burden of the asset on Volvo's books.** **Depreciation costs have an adverse effect not only on overall costs, but in Volvo's ability to competitively price its offering**

4.1.11 Summary of Interview Findings

Below is Table 4-1 Summary of Interview Findings assessing the composition of the elements that make up the business model canvas .

Table 4-1 Summary of Interview Findings

Acronym	Element	Description	Findings
CS	Customer Segments	An organization serves one or several Customer Segments.	Interviews revealed that the larger transport buyer are the most affected. Specifically, larger commercial operations that a publicly traded. These are covered by the scope of the IFRS 16 regulation and therefore face the most pressure in accessing off balance sheet capacity leasing solutions.
VP	Value Proposition	It seeks to solve customer problems and satisfy customer needs with value propositions.	value proposition interviews revealed that the main driver to secure off balance sheet capacity leases are mainly to limit the capital expenditure of the customer away from none core assets such as trucks. Additionally, larger Volvo customers are also seeking to limit the debt burden on their balance sheet. In regards to the solution itself, capacity contracts based on miles driven allow the customers to eliminate the fixed costs associated with asset ownership, allowing them to direct capital expenditure to production. The variable costs would be directly proportional to the use of the asset.
CH	Channels	Value propositions are delivered to customers through communication, distribution, and sales Channels	Findings from the interviews revealed that due to the complex nature of these capacity based contracts and coupled with the resource intensity and coordination required to deliver the service, the sales process is best coordinated through key account managers. The sales process is leveraged through the customer relationship with a solutions sales strategy.
CR	Customer Relationships	Customer relationships are established and maintained with each Customer Segment.	The customer relationship becomes exceedingly important within this PSS Based capacity based lease arrangements. Given that the nature of customers affected by IFRS approach are larger multinationals, relationships with customers must be leveraged both as a means to secure business but also as a means to ensure that service delivery is met. Results from the interviews showed that a project sales approach as opposed to a retail sales approach should be applied in the business model. The business model calls for the coordination of Volvo's organization in monitoring the customer relationship. It calls for the coordination and development at a national or international level with delivery on the relationship promise occurring on the ground with local dealers and market companies.
R\$	Revenue Streams	Revenue streams result from value propositions successfully offered to customers.	In summary, the interviews with Volvo stakeholder revealed a number of key points relating to the revenue element of the business model. The capacity based lease contracts are best designed by utilizing a trend analysis of past use to ensure capacity budgeting is cost effectively measured. Pricing argumentation is based on fulfilling capacity uptime and monetizing the additional packaged services that come the capacity contract. Revenues are maximized when selling solutions. Over and above the conventional

			business model, the revenue potential of a PSS capacity based leasing model is significantly higher. Capacity based contracts have more turnover potential as the customer’s business is kept within the business ecosystem. The negotiation of contractual terms to protect Volvo’s revenue potential needs to address the issue of minimum usage as well as the pricing around flexibility and protections against contract termination. The pricing strategy is about quantifying the risk and pricing the service on a customer to customer basis.
KR	Key Resources	Key resources are the assets required to offer and deliver the previously described elements...	In summary, the results of the Key resources showed that as a conduit for service delivery, the asset in abiding with IFRS 16 regulations remains the property of Volvo Trucks, who posses a substantive right to substitute the truck at any time during the contract period. The asset is used to deliver the uptime that the customer is paying for. Uptime is the available working time on the asset that the customer can readily utilize and that Volvo can bill for. Taking into account the substitution rights available to Volvo, standardized truck specifications over standardized fleets appears to be the strategy most resonating with customers considering capacity leases. Where data gaps exist in the business model is on cost, which is discussed separately.
KA	Key Activities	...by performing a number of Key Activities.	In summarizing the key activities necessary in supporting Volvo’s new business model, results point to a solutions based sales approach that requires the coordination of various resources within Volvo to deliver on the value proposition. When it came to optimizing service delivery, results showed that monitoring was an essential operation for Volvo to carry out. The monitoring of the asset utilizes telemetry information from the truck, collected by software and hardware components installed in the truck known as Dynafleet. In addition to allowing Volvo to monitor and optimize the operations of the asset, Dynafleet allows for ride on services that include fuel advice and driver training to be offered to the customer as part of the value proposition. Diver training and fuel advice are two ways which Volvo can bolster its sustainability offering to the client while also reducing the customer’s variable costs on fuel.
KP	Key Partnerships	Some activities are outsourced and some resources are acquired outside the enterprise.	When packaging solutions for customers results revealed that certain elements are sourced from partners within the value chain. Volvo in its case needs key partnerships in component suppliers and truck body builders to supply the Value proposition.
C\$	Cost Structure	The business model elements result in the cost structure.	In summarizing the cost element of the business model, Volvo trucks must develop the competencies around the management of the asset. This involves being able to price the cost of operating the asset as well as the debt burden of the asset on Volvo’s books. Depreciation costs have an adverse effect not only on overall costs, but in Volvo’s ability to competitively price its offering.

4.2 Findings from Literature Review

The literature analysis in a bid to formulate a value proposition, relied on market study reports previously conducted by Volvo Trucks.

The Value Proposition Field Study Report published by Volvo in 2013 revealed 6 key pillars that form the basis of the customer value proposition.

1. Productivity
2. Fuel Efficiency
3. Uptime
4. Driver Appeal
5. Safety
6. Security

The study found that the top three influential factors in a truck purchasing decision as follows: **Productivity, Fuel Efficiency, Uptime (Volvo, 2013)**.

4.2.1 Productivity

Productivity is defined to be the utilization of the truck when deployed.

For professional transporters, such as those affected by the IFRS 16 regulations, productivity and in particular utilization and load capacity of the truck are seen by transporters as having the most influence on the revenue potential. As such, the ability to cycle a truck through successive deployments as well as maximizing its carrying capacity were deemed most influential in the purchasing decision.

In regards to productivity, the study further revealed value addition opportunities for Volvo by way of optimizing the operations of the customer, and by utilizing route planning technologies, both of which have a direct bearing on productivity. To meet this customer need, the report pointed to three key tools available to Volvo to meet productivity related customer needs;

1. **Dynafleet** - Volvo's fleet management system that allows for monitoring and route planning and optimization
2. **Right truck selection** - ensuring that the sales process is geared towards matching the customer need with the best truck specification.
3. **Ease of access to rentals** - The ability and ease at which to access a truck to meet a productivity need for the customer.

4.2.2 Fuel Efficiency

Fuel efficiency is defined as maximizing the utilization of a truck while lowering the fuel consumption. The study found that fuel accounted for the largest variable cost for commercial transporters. The fuel efficiency of a truck was found to be important as it has a direct bearing on revenue earnings and environmental impact (Volvo, 2013).

Additional findings showed that customer purchase decisions were influenced by the consumption and that in addition to seeking out fuel efficient truck models, customers bolstered their fuel economy by instituting driver training and speed limits. Additionally, customers were found to be conscious of their emissions, choosing to utilize Adblue, a catalytic compound that reduces emissions on diesel engines, in their trucks (Volvo, 2013).

In addressing the two customer needs of lowering fuel consumption and emissions, the report found opportunities for Volvo Trucks to utilize the following:

Dynafleet - Volvo's fleet management system that allows for fuel management with real time driver feedback on driving technique and fuel consumption.

Driver Training - An additional service to develop driver competencies and skills around fuel saving techniques.

4.2.3 Uptime

Uptime refers to the truck's availability to perform a task. These available working hours are limited by planned maintenance and repairs as well as unexpected breakdowns.

The results of the study showed that professional transporters face a number of costs related to maintaining uptime including replacement costs, repair costs and lost business. To mitigate the risks around downtime, the report found that most professional transporters opted for full service and maintenance contracts to minimize their risks. In additions the report found that customers planned their maintenance and repairs with a goal to minimize interruptions to productivity as well as proactively maintaining the truck to prevent breakdowns (Volvo, 2013).

In addressing the challenges around maintaining uptime, the report found opportunities within Volvo focused on;

Dynafleet - Volvo's fleet management system that allows for telematics and monitoring to ensure that the trucks is in operating condition though the onboard diagnostics system.

Full service and maintenance contracts - These contracts minimize the risk of expensive breakdown and maintenance costs covered by the agreements. These contracts were found to reduce variable costs and provided peace of mind.

4.2.4 Summary of Findings from literature review

Below is Table 4-2 Summary of Findings from literature review.

Table 4-2 Summary of Findings from literature review

Business Model Canvas Element	Findings from Literature Review
Value Proposition	The 3 key factors that influence a customer's truck purchasing decision include: Productivity, Fuel Efficiency, and Uptime. A value proposition therefore includes incorporating monitoring technology to enhance the utilization of the truck, monitoring of performance and fuel consumption. The value proposition also focuses on behavioral change by incorporating driver training to achieve sustainable reduction in fuel consumption.
Customer Relationships	The customer relationship is the building block of any business relationship. Understanding the customer's need is a crucial element in formulating the service solution.
Key Resources	In delivering on the value proposition a number of resources will need to be employed. The primary resource is the truck which has to be suited to deliver on the core competency of the customer. Secondary resources necessary to support the truck include monitoring technologies supported by Dynafleet to deliver on higher productivity, fuel savings and uptime. Additional services include driver training to instill good driving techniques that save on fuel.
Key Partnerships	A key deliverable for customers in addition to fuel savings is the reduction of emissions. Key partnerships are necessary in fuel development as emission mitigation technologies as is the case with Adblue.

5 Discussion and Analysis

In this chapter, the results derived from interviews and literature analysis will be contextualized to answer the research questions as summarized in the table below.

Table 5-1 Research Questions and Sub-questions

Structure of contract	
RQ1	<i>What are the key attributes of a business model built in line with the PSS ideology and compliant to the provisions of IFRS16?</i>
Sub-questions	<i>What criteria will the new contracts need to meet to be considered off-balance sheet as defined in IFRS 16?</i> <i>What is the structure and logic of the new off-balance contracts?</i>
Value Proposition	
RQ2	<i>What is the new customer value proposition in light of the IFRS 16 changes?</i>
Sub-questions	<i>What factors influence a rental decision?</i> <i>What bundled services are necessary for supporting the rental contract?</i>
PSS and Sustainability	
RQ3	<i>How does Volvo Trucks relate to sustainable development aspects in the new value proposition model?</i>
Sub-questions	<i>What products and services can be bundled together in the lease to deliver environmental savings?</i> <i>How can Volvo promote the uptake of best available technologies to its customers?</i>

5.1 RQ 1. What is the structure of the new off-balance contract?

What criteria will the new contracts need to meet to be considered off-balance sheet as defined in IFRS 16?

To contextualize the development of the new business model a basis of understanding had to be developed around the understanding of the IFRS 16 accounting regulations and the manner in which they affect Volvo Truck's leasing model.

Published by The International Accounting Standards Board (IASB) in January 2016, the International Financial Reporting Standards (IFRS 16), guidelines on leasing standards become effective on January 1st, 2019. These standards specifically affect Volvo Truck's

leasing model as the regulation sets out the principles for the recognition, measurement, presentation and disclosure of leases for both parties to a contract, i.e. the customer ('lessee') and the supplier ('lessor') (IFRS, 2016b).

Under the IFRS 16 regulations, rental and lease contracts currently provided by Volvo to their customers would no-longer be considered as being off balance sheet as is the case under the current leasing regulation IAS 17 (PwC, 2016). Under IFRS 16, financial leases and operating leases will be indistinguishable as both will be treated as on balance sheet entries. Furthermore, IFRS 16 specifically defines what constitutes a lease. A lease is considered to be an agreement that transfers the right to use and control of an identified asset, including subsets that make up the parts of the complete asset (EY, 2016).

The challenge that the IFRS 16 regulations pose to Volvo Truck's business model are specific to the consequences these new regulations will have on their customers' financial position. The new regulations will directly impact Volvo's larger customers, who are publicly listed on the stock exchange and therefore subject to IFRS 16. Under IFRS 16 current leases will be declared on the balance sheet as outstanding debt liabilities. For Volvo's customers, this means a significant debt burden that negatively affects their financial ratios, which for publicly listed companies, negatively affects investor confidence (PwC, 2016).

To continue offering off balance sheet rental solutions, Volvo Truck's would need to restructure its rental and leasing model to take into account IFRS 16's definition of a lease, which is a contract where the right of use to an asset is granted for a time in exchange for compensation. A lease therefore is a contract that transfers the right to use and control of an identified asset, including subsets that make up the parts of the complete asset.

Two key criteria are highlighted in the regulation as the threshold met by a lease. These are

1. **Identified Asset** - A lessee is said to possess an identified asset if there exist no substantial substitution rights for the asset on the part of the lessor. Substitution rights when exercised must create value for either the lessor or the lessee.
2. **Right of control** - an agreement is said to be a lease if the lessee derives benefits from a majority of the useful life of the asset. A lessee is said to possess the right of control if they have the unfettered right to direct the use and application of the asset when deployed (EY, 2016).

Through an interview with an IFRS expert within Volvo, the discussion around these two critical criteria revealed:

If there is so to say an identified asset - that's what it says in the standard, then if there is one particular truck in this case then you say that this is a lease. But if there is a possibility within Volvo for us to change that truck without any extra cost it think it says, and the lessor won't notice any difference, then we are more into service. So we don't need to end up on the balance sheet for the customer...So a lessee doesn't control the use of an identified asset if the lessor, Volvo, has substantive right to substitute the asset (Lundquist, 2016).

Substitution is hinged on Volvo Truck's ability as a lessor to monitor the use of the asset to determine maintenance and repair scheduling for the truck as well as truck replacement when trucks have reached a mileage ceiling requiring retirement. Monitoring on the truck's are hinged on Dynafleet which possesses telematics management to monitor the truck's performance and schedule repairs.

With substitution, Volvo Truck's new off balance sheet lease contracts will focus on value creation through service provision. Under IFRS 16, services are considered off balance as the transfer of the value from the lessee to the lessor is immaterial (KPMG, 2016).

What is the structure and logic of the new off-balance contracts?

In developing an understanding of the structure of off balance lease contracts, views were sourced from Volvo Construction Equipment, who have experience in developing solutions based on power-by-the-hour, where customers were afforded capacity based transportation services. In describing the structure of the contracts,

REDACTED (Sjöström, 2016).

The structure of these contracts is in three parts, Available hours - This is the upper limit of the capacity contract and represents 100% utilization of all available hours possible on the Truck. Guaranteed Hours - These are the true billable hours of service guaranteed to the customer. The percentage of guaranteed hours is a key performance indicator of the contract, with guaranteed uptime considered a key value proposition. Price - this is a flat rate that is pre-negotiated with the customer. As an hourly rate, this price factors in the running costs incurred by Volvo on the asset, as well as the cost of bundled services and including a margin for profit. In the case of VCE, price was determined by risk.

Its much more complicated since we are moving a large part of the risk from the customer side to the OEM side. So obviously we need to address that risk in terms of operating conditions and terms of use. How to use the equipment etc. To sort of put a limit on the risk or at least to price the risk. You need to do it in a way that is viable offer. It has a lot do with risk if you talk about the power by the hour set ups then if they are starting to buy capacity then you have to think about what is happening if they don't reach the capacity that we have priced. So different clauses come into play and obviously the customer would like to see as few clauses and restrictions as possible. As a buyer you'd like to limit the risk so its about balancing that (Lidhage, 2016).

Contractual terms and conditions are necessary to spread the risk Volvo Trucks is exposed to. Three specific terms and conditions are necessary. The uptime guarantee available to the customer is the key selling point. However, use requirements are also necessary on the part of the customer. Guaranteed minimum use ensures that Volvo is able to address its fixed costs regardless of customer use. A necessary clause revolves around termination and renegotiation of the contract. This is especially important if the contract period is renewed every 365 days to keep it off balance.

Determining the capacity need of the customer is specific to market segment and need. For VCE, their power-by-the-hour contracts provide capacity on an hourly rate based on engine on time. However, capacity can be delivered to the customer utilizing other capacity measures,

The representative ones, you talk about kilometers driven, you can talk about the hours of use, the weight and the volume. Those are the four main ones. Those are the basic ones. the three main ones are weight, kilometers and running hours (Lidhage, 2016).

...I would say for them what they are going to pay for is hours. If they don't use the machines, they don't pay. Whereas in a rental or a lease if they use it or don't use it, you still pay your monthly fee. Here it is purely use based. So that's two. And they don't care about any other thoughts of downtime, maintenance, planned maintenance, unplanned maintenance etc. In case there is downtime, or unplanned downtime, we pay penalties for that. So the risk is absolutely zero for them. Because in case they cannot use the machines as we promised them, they'll get paid for it. and that's the biggest risk for us (Cock, 2016).

... (In pricing) Sometimes the customer's business model is the guide. That one is not so difficult for us to figure out customer by customer. How do they get paid? That will usually reflect how they want to see

such a set up. Because they will also like to transfer the risk downstream if possible. But its examining the customer's business and the capacity measure will be more or less self-evident (Lidhage, 2016).

The delivery of a capacity based contract whereby the lessor as Volvo Trucks maintains a substantive right to substitute the truck or whereby the contractual period is less than 1 year, Volvo Trucks can claim to offer an off balance sheet capacity based lease. However, as Volvo's IFRS 16 expert points out, the decision is still the customer's on whether to book these capacity lease contracts as expenses or liabilities in their accounting reports.

But we should also remember that we cannot force the customer and tell them how to account for this. We can help them if they are covered by this IFRS 16 we can help them. But the choice of whether its a lease or service that's always up to the customer (Lundquist, 2016).

The service focus of the proposed off balance sheet contracts informs the choice of product service system as identified by the analytical framework. With a result driven capacity contract, a lease oriented product service system is identified as the the PSS that best meets the IFRS 16 threshold for off balance pay-per-service units. The classification framework is summarized in Figure 5-1 Overview of PSS Classification (Tukker, 2004) below.

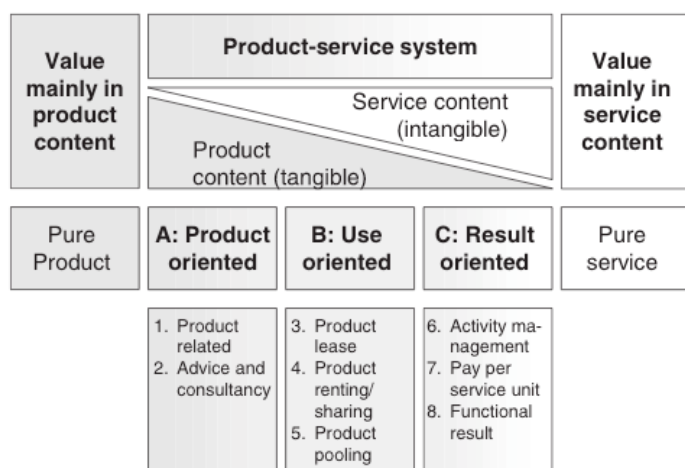


Figure 5-1 Overview of PSS Classification (Tukker, 2004)

Table 5-2 Overview of the proposed IFRS 16 compliant off balance sheet contract.

Table 5-2 Overview of the proposed IFRS 16 compliant off balance sheet contract.

Clause	Structure	Details
Capacity	Pay Per Service Unit	Capacity determined from customer to customer based on application. Capacity for pay per service unit could be measured in. <ul style="list-style-type: none"> Machine Operating hours Mileage Weight Volume
Pricing	Value Based Pricing	Pricing is determined by a number of factors. <ul style="list-style-type: none"> Application of the truck, Length of contract Fixed costs associated with asset ownership

		<p>including depreciation.</p> <ul style="list-style-type: none"> Bundled services supporting capacity contracts <p>Aligning the pricing strategy to the core competency of the consumer is necessary.</p>
Off Balance	Service Orientation	<p>Contract length of below 365 days or Contracts greater in length achieved by Utilizing Volvo truck's substantial right to substitute the truck meets the IFRS criteria of off balance sheet. Additionally, the lessee is leasing capacity and not an identified asset from Volvo Trucks.</p>
Terms and conditions	Risk Management	<p>A key selling point of the capacity based rental contracts is the guaranteed uptime of the asset. Uptime is guaranteed by monitoring the truck through telematics. Connectivity is the management tool that will facilitate Volvo's substantial right to substitute the truck either for maintenance and repair or replacement. Additional terms govern minimum usage of the truck to ensure that minimum utility can cover the fixed costs associated with the trucks. Risk can be managed by ensuring that termination clauses and contract term revision clauses are included to protect Volvo Truck's financial position. Trucks are additionally covered by insurance and maintenance warranties, factored into the final cost to the customer.</p>

5.2 RQ 2. What is the Customer Value Proposition?

In following with the analytical framework established in Chapter 2.4 a business model is developed around the nucleus of a results oriented product service system. In developing an understanding of the customer value proposition delivered by a result oriented PSS, an understanding of the customer preference for off balance sheet capacity based leasing contracts was attained through a literature review of market intelligence reports and interviews with rental customers.

An analysis of market intelligence reports found in The Value Proposition Field Study Report 2013, revealed that the top three key performance indicators in leasing contracts are

1. Productivity potential
2. Fuel efficiency
3. Uptime.

Interviews with leasing and rental customers revealed that in seeking out rental contracts beyond 2019 when IFRS 16 regulations come into effect, Volvo Truck's value proposition should address two main concerns.

- **Off balance sheet solution** - customers affected by IFRS 16 constitutes those businesses that are publicly traded on a stock exchange in Europe. Under current IAS 17 leasing regulations, these Volvo Truck customers currently access off balance sheet leasing solutions by purchasing operating leases. Beyond 2019 the ability to keep leases off the balance sheet as is the case with current day IAS 17 lease regulations expires. IFRS 16 will put significant debt pressure on Volvo's customers as they will have to declare all previously leased assets as liabilities. For

publicly traded companies, the added debt burden can lower investor confidence and negatively affect the stock value of the company (PwC, 2016). On this issue, interviews with Volvo Construction Equipment revealed;

REDACTED (Cock, 2016).

- **Reducing capital expenditure** - In addition to maintaining an off balance sheet rental solution, customers expressed a need to reduce capital expenditure on non-core assets. Under IFRS 16 regulations leases would be declared as liabilities and not expenses. This in turn would mean that Volvo's customer's would be pooling capital expenditure around non-core activities and assets, limiting their business' growth. In elaborating on this issue a customer expressed,

It would be rather important to us. so it would be a four on a scale to 5 (on importance for us to access off balance solutions.) We need to spend our Capex on building dairies, stainless steel pipes. not trucks. it all depends on cost and price (Hansen, 2016).

In addressing the two key challenges as well as meeting high deliverables on the 3 key performance indicators of productivity potential, fuel efficiency and uptime, a customer value proposition is designed to address the challenges as well as delivering value to the customer. The customer value proposition for an off balance sheet product service system is summarized as.

- **Off balance sheet solution** - The IFRS 16 compliant capacity based contracts whereby the focus is on service delivery and results. The trucks utilized for capacity delivery are owned by Volvo Trucks who have a substantive right to substitute the truck and determine how its deployed while in use. Additional to Volvo's substantive right, contracts can be offered under 1 year as well to be considered off-balance sheet.
- **Reducing Capex** - The off balance sheet capacity based contracts eliminate the fixed costs a customer would otherwise be exposed to through truck ownership or by declaring leased trucks on their balance sheet. The costs associated with transportation are fixed per unit of consumption as determined by the capacity and cost defined in the contract. In so doing, transportation costs are directly proportional to use or customer output. Capital is freed up allowing the customer to invest into their core competency.

The customer value proposition addresses the key performance indicators as follows:

- **Productivity potential**- The literature review of market intelligence reports suggests that productivity is the most influential key performance indicator of a rental agreement. Productivity highlights the ability to utilize a truck to maximize economic benefit for the customer. The key value addition to this metric presented by the proposed value proposition focuses on customer operations optimization by way of route optimization and utilizing the right truck selection to fulfill the capacity need.
- **Uptime** - this key performance indicator refers to the ability to keep the truck as an asset running and in operational condition in readiness for deployment. Uptime is a key selling point of the off balance sheet capacity based contracts. The revenue conversion of the capacity contracts is based on the availability and use of the truck multiplied by the base charge per consumption unit. Availability and uptime which involves managing the maintenance and performance of the truck, are best

managed by monitoring, which is integrated as a solution by way of Volvo's Dynafleet hardware and software technology.

5.3 RQ. 3 How does Volvo promote sustainability with its value proposition?

Fuel Efficiency is a crucial key performance indicator in adjudging the performance of a lease. Considered alongside productivity potential and uptime, efficiency makes up the final piece of the 3 key performance indicators that customers consider when making a rental decision.

The off balance sheet contracts as discussed and analyzed in Chapter 5.1 seek to deliver value to the customer by way of providing transportation capacity. These all inclusive contracts are result based pair per service unit contracts, whereby the customer is provided a bundled all inclusive contract that includes the truck and bundled services. With these contracts, the customer is only responsible only two variable costs which are the cost of the driver and the cost of fuel.

Fuel efficiency becomes a significant performance measurement as it accounts for the largest proportion of variable cost associated with transportation. Fuel efficiency also has a significant bearing on the sustainability profile of the customer. On the importance of fuel efficiency and by extension emission mitigation, Volvo Trucks finds that About 90% of the environmental impact generated by a truck occurs during its operation – mostly through fuel consumption and the discharge of carbon dioxide and other emissions. This is why energy efficiency and alternative fuels play the central role in Volvo's environmental approach (Volvo, 2016b).

Improved energy efficiency is one way in which Volvo can pass sustainability value to its customers in its value proposition. This research found that Volvo Trucks can enhance energy efficiency as a value proposition by,

Monitoring - Included as part of Dynafleet, Driver Coaching is an onboard function that guides the driver to improved driving behavior. This is achieved through real time monitoring of the driving style with instant evaluation of the Fuel Efficiency Score performance. When the driver deviates from wanted driving behavior, the Driver Coaching functionality instantly gives the driver tips on the display on how to improve (Trucks, 2016).

Driver Training and fuel advice -Fuel economy driving is centered around fuel efficient driving and teaches various techniques and skills that, if applied correctly, can help lower fuel consumption and increase the overall mpg of the vehicle has the ability to deliver (Volvo, 2016a).

Effective monitoring and behavioral training are the key to effective and sustainable reduction on fuel consumption and emissions. Interviews revealed,

Of course with the trucks we try and make them as environmentally friendly for the application as possible. that's what you get when you choose a Volvo. But then again with Dynafleet you can follow the emissions and you can reduce consumption by training drivers and following up on our services. and consumption and emissions from that perspective have a one to one relationship. So from that point of view we have offers that can help our customers. At the end of the day there needs to be someone that is willing to pay and set the requirements. And we see that more and more (Lidhage, 2016).

Fuel advice or lowering fuel consumption is very much to tell the driver this is tracked and you should do this and that and then we follow up on that. and if the drivers are taking the information and changing we

will see the result from it. It is very much a process. Then to do that on a regular basis and to see when old habits are coming back. Because I would say that any driver could improve his fuel efficiency. 1-2% or up to 10, 15, 20% depending at what level you start. And this is what I was talking about. Without follow up we have a level of fuel consumption, then we make an improvement from the training. And we see a result, but we also tend to see that often without following up, they tend to go back into their old behavior (Börjesson, 2016).

Beyond fuel advice, Volvo trucks can also support their customer's sustainability and fuel reduction goals by introducing best available technologies into the leasing fleet. Volvo truck's commitment to best available technologies has seen the efficiency of Volvo Truck's increase by 40% in the last 40 years with a commitment to a 1% efficiency increase annually (Volvo, 2016c).

In meeting the customer value proposition, a results oriented PSS delivers economic and environmental savings by tying in the environmental benefits associated with operational efficiencies to maximizing the cost savings passed on to the customer

6 Reflections

In this chapter, the results from the analysis and discussion found in previous chapters is discussed in context to the academic literature. Herein the findings from the research are contrasted with the theoretical context of sustainable product service system business models.

6.1 Reflections on the business model.

An examination of the business model canvas elements that support the off balance sheet capacity contracts are examined as the sum of their parts and whether the objective of the research to deliver a business model that supports IFRS 16 compliant rental and lease contracts has been met.

Figure 6-1 Volvo Truck's PSS Business Model represents the the PSS based business model supporting off balance sheet rental contracts.

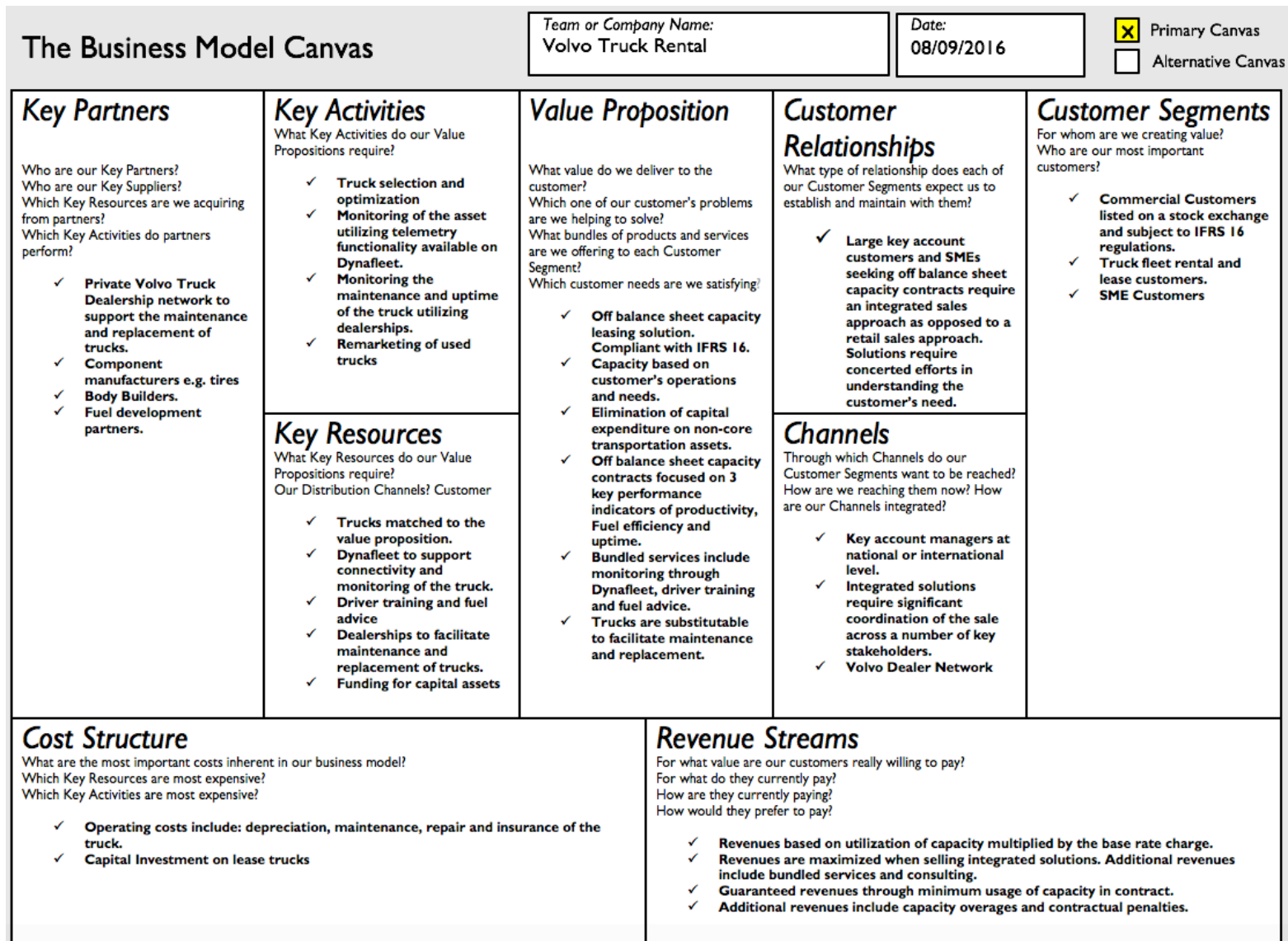


Figure 6-1 Volvo Truck's PSS Business Model

By definition, a business model is the means by which an organization addresses two main issues. Namely, how to create value for customers and how to capture a profit in return (Casadesus-Masanell & Ricart, 2010). In regard to the business model presented as part of these findings both issues are addressed as follows:

Value Creation - The proposed business model sets about creating value for truck rental and lease customers subject to IFRS 16 regulations. Value is created by way of capacity based contracts modeled as result oriented PSS.

Value Capture - The proposed business model captures value by selling off balance sheet capacity leases utilizing product and bundled service combinations to service customers in need of integrated transportation solutions.

The business model is also discussed as a mediation tool that bridges innovation and economic value. To this point, business models as management tools allow business decision makers to capture the value of an innovation and derive commercial gain in the market by presenting consumers with a value proposition that meets their preference (Chesbrough & Rosenbloom, 2002). The methodology employed in this research set to achieve this by quantifying the need in the consumer market for off balance sheet lease solutions. Deriving information from interviews and literature, the business model presented answers the research questions presented and sets a hypothesis for how value can be delivered and captured.

6.2 Reflections on the new business models as it relates to key business concepts.

In the following section the proposed business model is discussed in context to the 6 key business concepts discussed in Chapter 2.

Value Creation - Business models have the ability to function in two ways. By way of employing value creation mechanisms, (Amit & Zott, 2001) - the perceived benefit to the customer (Verdin & Tackx, 2015), or by value capturing mechanisms (Zott et al., 2011) - the pricing and cost structures of the business (Verdin & Tackx, 2015).

In discussing both functions in context to the proposed business model, value creation is done by way of the proposed capacity contract whose main value proposition is meeting the threshold set by IFRS 16 regulations to be considered off balance sheet. Value for the consumer is created through the utilization of transportation capacity. This value is captured by way of capacity contracts whereby revenues are determined by the utilization of capacity units multiplied by a rate price.

The business model is far from a play by play handbook on how to run and operate a business. Rather, a business model is a hypothesis geared at delivering customer value, and recouping the commercial benefits through revenues (Chesbrough & Rosenbloom, 2002). Interviews point to the need to develop competencies internally at Volvo on how to provide off balance sheet solutions and specifically how to model revenue and cost models.

REDACTED (Cock, 2016).

Business model vs. Strategy - The business model is far from a play by play handbook on how to run and operate a business. Rather, a business model is a hypothesis geared at delivering customer value, and capturing it. The term business model and strategy are confused and wrongly used interchangeably (Magretta, 2002) (Casadesus-Masanell & Ricart, 2010). Strategy by definition encompasses the deliberate actions, tactical responses

and organizational learning employed by management to create sustainable competitive advantage (Mansfield & Fourie, 2004). Comparing and contrasting a business model to strategy points, the latter is employed in response to competitive pressure, while the business model remains a blueprint on how the business meets the needs of the consumer (Seddon & Lewis, 2003).

The proposed business model is a culmination of identifying a need in the market for off balance sheet lease and rental solutions and presenting a hypothesis for how capacity based contracts can satisfy this need. To competitively align the value proposition presented in the proposed business model to market, a separate product to market strategy would need to be developed whereby the focus is on value capturing, sustainable competition, competitive advantage and differentiation (Chesbrough & Rosenbloom, 2002), (Magretta, 2002), (Mansfield & Fourie, 2004), (Zott et al., 2011).

Business models and Organizational alignment- Effective new business model development is a collaborative process that involves management and employees. In so doing, buy in is created and there is less chance from failure that would otherwise occur if employees are unaware of the business model and their role, or if employees resist the implementation of a business model due to lack of inclusiveness (Santos et al., 2009). The proposed business model calls for internal cohesion and collaboration internally as is presented when discussing the dexterity of business activities within the business model. Innovative new business models can face bias when managers and employees compare their performance to an existing and successful business model. This bias if unchecked can stifle innovation and prevent a business from realizing revenues and new market opportunities (Chesbrough & Rosenbloom, 2002).

Speaking on new business model development, Volvo Construction Equipment of their experience stated

REDACTED (Sjöström, 2016).

Business model resources and activities- Value, as previously discussed in the earlier sections, is a critical deliverable of the business model. To create value, resources and activities are required (Chesbrough & Rosenbloom, 2002), (Zott et al., 2011).

The fleet of trucks constitutes assets necessary to deliver on the value proposition. The trucks in particular hold significant risk that has been previously discussed including depreciation and maintenance and upkeep cost. Of the resources and activities necessary to support a capacity based off balance sheet business model,

REDACTED (Sjöström, 2016).

Business models vs cost and revenue streams - As the architecture that facilitates revenue collection (Chesbrough & Rosenbloom, 2002), a business model summarizes the logic of value creation and a business's ability to recoup financial benefit by applying its resources to gain competitive advantage within a market (Teece, 2010).

The trucks as an asset presents both cost and revenue avenues for Volvo Trucks. The quality and upkeep of the asset leads to higher residual value. The higher the residual value of an asset, the more competitively priced a capacity contract can be.

REDACTED

Whereas competitors have developed competencies around their cost and revenue models, this business model presents a starting point in the development of said competencies.

REDACTED (Sjöström, 2016).

Business models and innovation - Innovation within a business model can occur in a number of ways. Innovation can be achieved through the reengineering of internal processes and resources or through collaborative efforts within the value network, whereby stakeholder relationships are leveraged to realize new products and services (Zott et al., 2011). This open innovation strategy involves pooling ideas from customers or resources from the supply chain or competitors, to deliver on new innovations to bring to market (Dahlander & Gann, 2010).

Innovation around the development of off balance sheet capacity rental contracts stems from the push by customers for the development of such transportation solutions. On the importance of customers to the development of innovative solutions,

REDACTED (Cock, 2016).

The development of this business model is therefore informed by the demand push by customers for Volvo to innovate in this space.

6.3 Reflections on PSS and Sustainability.

Product Service Systems have the potential to deliver sustainable solutions over and above conventional models if they are designed with that in mind (O. Mont, 2000). PSS attempts to address the consumer need through a combination of product and services. The sustainability of a PSS system is gauged on its ability to provide the capacity to fulfill the consumer's need. This approach has the potential off unlocking sustainability benefits by lessening the raw material usage, improvements in disposal and end of life management as well as reduced energy intensity in the usage phase. These benefits are achieved due the PSS provider's ownership and management of the asset throughout its lifecycle (Tukker & Tischner, 2006a).

The Product service system element of this business model is represented by the logic of how the value proposition is summarized on the capacity contract. The off balance sheet capacity contracts address the sustainability challenge by moderating consumption by way of efficiently allocating capacity based on the scope of the need. Additionally, bundled services including Dynafleet and fuel advice reduce the energy intensity of the trucks. With ownership of the truck belonging to Volvo for the duration of the lifecycle, the customer is no longer expected to manage end of life of the asset.

Below is a summary of the proposed capacity based contract.

Table 6-1 Overview of the proposed IFRS 16 compliant off balance sheet contract.

Clause	Structure	Details
Capacity	Pay Per Service Unit	Capacity determined from customer to customer based on application. Capacity for pay per service unit could be measured in. <ul style="list-style-type: none"> • Machine Operating hours • Mileage

		<ul style="list-style-type: none"> • Weight • Volume
Pricing	Value Based Pricing	<p>Pricing is determined by a number of factors.</p> <ul style="list-style-type: none"> • Application of the truck, • Length of contract • Fixed costs associated with asset ownership including depreciation. • Bundled services supporting capacity contracts <p>Aligning the pricing strategy to the core competency of the consumer is necessary.</p>
Off Balance	Service Orientation	<p>Contract length of below 365 days or Contracts greater in length achieved by Utilizing Volvo truck's substantial right to substitute the truck meets the IFRS criteria of off balance sheet. Additionally, the lessee is leasing capacity and not an identified asset from Volvo Trucks.</p>
Terms and conditions	Risk Management	<p>A key selling point of the capacity based rental contracts is the guaranteed uptime of the asset. Uptime is guaranteed by monitoring the truck through telematics. Connectivity is the management tool that will facilitate Volvo's substantial right to substitute the truck either for maintenance and repair or replacement. Additional terms govern minimum usage of the truck to ensure that minimum utility can cover the fixed costs associated with the trucks. Risk can be managed by ensuring that termination clauses and contract term revision clauses are included to protect Volvo Truck's financial position. Trucks are additionally covered by insurance and maintenance warranties, factored into the final cost to the customer.</p>

In summarizing the reflections, the business model and the capacity contracts it supports, a number of uncertainties prevail on the management of PSS based business models. Volvo Trucks in providing a solution to its customers need apply effectuation in a business case where the means are often clear but not the end (Sarasvathy, 2009). The challenge of discovery driven solutions and indeed the business models to support them is that there is often limited information about the market and how the innovation interacts with it. As such, the innovative process is a balance between synthesizing market intelligence where available and coupling it with 'outside the box' innovation in the hopes of delivering a solution that creates value for the consumer and a business model that effectively captures it (Tece, 2010).

6.4 Reflections on Methodology

This thesis sought to answer three questions specifically tied to Volvo Truck's ambition to offer off balance sheet solutions to its rental and lease customer. The three questions informed the development of a business model and an off balance sheet capacity contract.

1. *What are the key attributes of a business model built in line with the PSS ideology and compliant to the provisions of IFRS16?*
2. *What is the new customer value proposition in light of the IFRS 16 changes?*

3. *How does Volvo Trucks relate to sustainable development aspects in the new value proposition model?*

This thesis is supported by 2 research methods namely: Literature review and interviews.

Literature review examined market intelligence reports to develop an understanding of the value proposition and the key factors that influence the customer's decision to utilize rental and lease truck capacity. The literature review revealed 3 key performance indicators that a viable customer value proposition can be built on. Namely; productivity potential, fuel efficiency and uptime and availability.

In-depth interview were utilized as the source of primary data to understand the scope of the IFRS 16 regulation and identify the potential solutions available for off balance sheet leasing solutions. Additionally, the interviews gauged the demand for the said solutions by gauging views from Volvo Truck customers. Further fact finding through interviews involved benchmarking the new business model proposal to existing power-by-the-hour contracts developed within the Volvo Group.

Reflecting on the literature review, though limitations did exist that limited the utilization of confidential market intelligence reports in this thesis information regarding market preferences for rental contracts was secured without compromising the confidentiality of referenced literature. In addition to interviews, a survey was planned and sent out to customers. However, responses were not forthcoming and therefore limited the quantity of data given. However, data collected through in-depth interviews did provide conclusive answers to the research questions posed in this study.

6.5 Further Research

The results and discussions chapter of this thesis both point to a need for more research. Indeed, as a business model more clarity in regards to the costs and revenue structure of the client must be researched to give definitive financial numbers on the viability of this model. Echoing the challenges of this fete VCE one of the few Volvo divisions with experience in offering capacity based contracts observed

REDACTED (Sjöström, 2016).

Development of the said competencies creates way for Volvo trucks to roll out the service to a potentially wider market if profitability of the model can be determined.

7 Conclusion

This thesis set the objective of developing a lease and rental model for Volvo trucks that is based on product service system. Presented as a service, the goal is to deliver an off balance sheet rental model for Volvo Truck customers in compliance with IFRS 16 regulations.

To meet this objective, three research questions were asked:

1. What are the key attributes of a business model built in line with the PSS ideology and compliant to the provisions of IFRS16?
2. What is the new customer value proposition in light of the IFRS 16 changes?
3. How does Volvo Trucks relate to sustainable development aspects in the new value proposition model?

This thesis employed literature analysis and interviews as methods in determining answers for the research questions posed.

Results from the literature review outlined 3 key performance indicators that influence the customer's choice of rental contracts. Those key factors include productivity potential, fuel efficiency and uptime and availability of the truck.

Results from the interviews revealed that larger transport buyers are the most affected by the IFRS 16 regulations. Specifically, larger commercial operations that are publicly traded. These are covered by the scope of the IFRS 16 regulation and therefore face the most pressure in accessing off balance sheet capacity leasing solutions. value proposition interviews revealed that the main driver to secure off balance sheet capacity leases are mainly to limit the capital expenditure of the customer away from none core assets such as trucks. Additionally, larger Volvo customers are also seeking to limit the debt burden on their balance sheet. In regards to the solution itself, capacity contracts based on miles driven allow the customers to eliminate the fixed costs associated with asset ownership, allowing them to direct capital expenditure to production. The variable costs would be directly proportional to the use of the asset.

Due to the complex nature of these capacity based contracts and coupled with the resource intensity and coordination required to deliver the service, the sales process is best coordinated through key account managers. The sales process is leveraged through the customer relationship with a solutions sales strategy. The customer relationship becomes exceedingly important within this PSS Based capacity based lease arrangements. Given that the nature of customers affected by IFRS approach are larger multinationals, relationships with customers must be leveraged both as a means to secure business but also as a means to ensure that service delivery is met. Results showed that a project sales approach as opposed to a retail sales approach should be applied in the business model. The business model calls for the coordination of Volvo's organization in monitoring the customer relationship. It calls for the coordination and development at a national or international level with delivery on the relationship promise occurring on the ground with local dealers and market companies.

Trucks as a conduit for service delivery, and in abiding with IFRS 16 regulations remain the property of Volvo Trucks, who posses a substantive right to substitute the truck at any time during the contract period. The asset is used to deliver the uptime that the customer is paying for. Uptime is the available working time on the asset that the customer can readily utilize and that Volvo can bill for. Taking into account the substitution rights available to Volvo, standardized truck specifications over standardized fleets appears to be

the strategy most resonating with customers considering capacity leases. Where data gaps exist in the business model is on cost, which is discussed separately.

In summarizing the key activities necessary in supporting Volvo's new business model, results point to a solutions based sales approach that requires the coordination of various resources within Volvo to deliver on the value proposition. When it came to optimizing service delivery, results showed that monitoring was an essential operation for Volvo to carry out. The monitoring of the asset utilizes telemetry information from the truck, collected by software and hardware components installed in the truck known as Dynafleet. In addition to allowing Volvo to monitor and optimize the operations of the asset, Dynafleet allows for ride on services that include fuel advice and driver training to be offered to the customer as part of the value proposition. Driver training and fuel advice are two ways which Volvo can bolster its sustainability offering to the client while also reducing the customer's variable costs on fuel.

When packaging solutions for customer's results revealed that certain elements are sourced from partners within the value chain. Volvo in its case needs key partnerships in component suppliers and truck body builders to supply the Value proposition.

In summarizing the cost element of the business model, Volvo trucks must develop the competencies around the management of the asset. This involves being able to price the cost of operating the asset as well as the debt burden of the asset on Volvo's books. Depreciation costs have an adverse effect not only on overall costs, but in Volvo's ability to competitively price its offering

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