The Remanufacturing Offer

A Case Study of Volvo Construction Equipment
Implementing and Expanding Reman in Russia

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SUMMARY

This thesis is about Reman (acronym for Remanufactured Products) which is an alternative to buying a new product. It is a product offering by Volvo Construction Equipment, and also by many other firms in various manufacturing industries. It involves a customer exchanging a used product for a “remanufactured” or Reman product. In specific, this research focuses on the Russian market – perceived as one restricted market – which is represented by Volvo Vostok.

This Bachelor Thesis covers the advantages and disadvantages of Reman, as an alternative to the purchase of a brand new product. More importantly, this research identifies variables which are vital to the decision making process of implementing or expanding a Reman program, taking as a case study reference the Russian market.

This thesis has identified the most important variables which must be analyzed when deciding upon the implementation or expansion of a Reman program – i.e. the set up of a Reman production plant, the expansion of a Reman production plant, and a set of standard operation procedures (SOPs) for a Reman trading system. These variables include market potential, critical mass of machines as well as the strategic importance of the market.

Reman is not the ultimate option in every case as alternatives may be better in some cases – such as exchanging used parts of a machine for new spare parts or buying a reconstructed/repai red replacement.

VCE buys back used machine cores as to perform Reman; therefore, the perceived and actual value of a new machine is higher when the customer realises that he can sell back to VCE his used core and components after a certain number of hours, instead of simply scrapping it. This also replaces a manufacturer’s scrapping costs, as they may be legally responsible to dispose of their customers’ used products (in some regions i.e. EU).

The implementation or expansion of a Reman program is a strategic decision; it affects both sales of new machines and the after-sales product support. There is an unavoidable cannibalisation of new product sales by Reman sales, but this cannibalisation leads to higher total sales of parts. In other words, cannibalisation leads to mutual growth for both Reman and New products.

Keywords: Competitiveness; Market Potential; Remanufacturing; Restrictions.

We hereby thank Professor Sten Söderman for his help and support throughout this thesis.

Kind Regards,

Carlos Stelin and Fredrik Sandvall
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1 INTRODUCTION

The concept of remanufactured products will be introduced in this chapter, with insight into the restricted markets in which Volvo Construction Equipment is investigating the feasibility, costs and benefits of introducing and/or expanding it. This study will repeatedly refer itself to the concept of remanufactured products as “Reman”.

1.1 Volvo and Reman in the Construction Equipment Industry

Volvo Construction Equipment (Volvo CE) is one of the top five companies in the construction equipment industry, an industry valued at roughly US$ 51 billion. Headquartered in Brussels, Belgium, and present in 150 countries, Volvo CE holds about 6% of the world market for construction equipment (Respondents A).

Reman is an acronym used in reference to remanufactured parts. Volvo CE’s Reman program is not necessarily an original idea, as it is used by several if not all of its competitors, but Volvo CE holds evidence to back their claims that Volvo CE’s Reman program offers the best value for its customers. In the section concerning Reman in Volvo CE’s website, it is clearly stated that “factory remanufactured genuine components [give] the same performance, service life and warranty as a new one. [Reman components are modified] to the latest version with the technical improvements that have been introduced in production” (Internet B). As mentioned above, Reman is carried out in many different industries, and “remanufactured products are typically upgraded to the quality standards of a new product, so that they can be sold in a new product markets” (Savaskan et al, 2004, p. 239).

Reman is an alternative to buying a new engine or spare part, and cannibalises the sales of new components, overhaul kits and spare parts. The concept of cannibalisation is further developed in the Analysis Chapter 5. In order to differentiate Reman from other products, Figure 1 explains the differences between various product offers. This table is especially helpful to readers who are not familiar with the manufacturing equipment, and clearly shows which alternatives are typically available to customers in this industry.

<table>
<thead>
<tr>
<th>Definition</th>
<th>Characteristics</th>
<th>Profit Margin</th>
</tr>
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<tbody>
<tr>
<td>New Product</td>
<td>A new engine or part</td>
<td>10-15%</td>
</tr>
<tr>
<td>Overhaul Kits</td>
<td>A kit with all the necessary components needing replacement</td>
<td>30-45%</td>
</tr>
<tr>
<td>Repairs</td>
<td>Workshop repairs on broken or faulty parts</td>
<td>Depends on product condition and cost of repair</td>
</tr>
<tr>
<td>Parts</td>
<td>Customers can replace their faulty parts with spare new ones</td>
<td>20-50% (depending on component)</td>
</tr>
<tr>
<td>Reman</td>
<td>Volvo factory remanufactured components</td>
<td>Anything between 15% and 60% (depending on component)</td>
</tr>
</tbody>
</table>

*Figure 1. Customer Offers* (By authors, based on business case by Respondents G)

Reman offers Volvo CE the opportunity to cut costs in the production and re-supplying of its customers, since a Reman engine preserves 85% of the energy involved in the production of a new engine, remembering that each core can be remanufactured up to five times, and that the profit margin on a Reman product is profitably high (Respondents D).
Volvo CE today offers remanufactured parts for certain components for certain situations, such as the regeneration and update of obsolete and/or completely worn out parts. An original Volvo CE engine is designed to perform efficiently for long periods of time; this figure in years would vary according to how often the machine is used in terms of a specified time-frame as a basis for performance-analysis.

The Reman offer is part of a strategy to take a share of the customer support market, which is often occupied solely by workshops and not the original manufacturer. It represents a potentially large part of total sales, thus why manufacturing firms should aim to transform their own after sales support into a necessity for the customer. Many manufacturing firms (also within the construction equipment industry) offer Reman or a similar program, and those who don’t offer an equivalent alternative may lose customers to competition (Respondents C). By offering this product, customers are unlikely to move elsewhere (Ferrer, 2006, p. 15).

Customers appreciate an efficient after sales support for their products, especially in the highly expensive construction equipment industry. Price and range of Reman products, as well as the quality greatly affects a customer’s buying decision, considering this happens in a market where Reman is a known product – otherwise, the market first needs to be introduced to the Reman offer. If Volvo does not offer the same level of after sales support such as Reman as their competitors do, the customer might go elsewhere. This strategic decision is also important for Volvo CE in its pursue of environmental preservation. The following sections further develop the concept that Reman is essential.

The Reman offer is suitable for markets with either a relevant high density/population of machines (of the same model) or easy logistical and bureaucratic solutions to exporting a used core/product in exchange for the importing of a Reman product from abroad (Respondents M). Volvo CE has already identified targeted customers in this segment. In immature markets and markets restricted by certain regulations, the Reman offering may come to being a challenging issue. Countries such as Russia are considered restricted markets, and these are the two main areas of focus covered by this study. These have severe restrictions on the import and export of used products. This study will focus on the likelihood, implications and benefits of introducing Reman in such restricted markets.

Reman customers already own a Volvo CE product, and can therefore adhere to the Reman offer through a “swing” system. A “swing” system is where an old product is exchanged for a remanufactured product. Without providing Volvo CE with a used component or engine core, a customer cannot expect to receive a Reman products, as his used/worn parts and cores feed into the life cycle of the swing system (Respondents A). This offer suits customers who see in Reman products the possibility of good performance with a remanufactured used-product at a lower price than that of a new product.

Strictly speaking, Reman can therefore be considered as a direct competitor to the sales of new products (see Chapter 5). If Volvo CE chose not to offer Reman, and its competitors do offer Reman, the competition can be seen as embracing in a commitment with its customers; as a consequence, these customers may opt for competitors’ products. Reman has therefore become an industry-essential for any company wishing to compete efficiently at the top of the market.

To understand one of the purposes and importance of Reman, it is helpful to relate back to the Volvo Group’s three core values, “quality, safety and care for the environment” this should all be integrated in the products (The Volvo Way, 2005). Reman can first and foremost be considered a sustainable source of raw materials for the productions of products, since old products and their raw materials are reutilised, which may not always require recycling. The quality of the product is the same as that of new one, and it is updated to the same safety and performance standards to that of a new one (remembering that it still is not a new product). As Reman fulfils these three core values and the objective of profitability, all pursued within the Volvo Group, it should be addressed rightly as a purposeful activity.
Volvo CE’s Reman program has a specially delicate task of offering reliable and cheaper alternatives to substituting a customer’s used engine by a remanufactured one, while trying to avoid cannibalization of new components as much as possible (Respondents B).

It is a contradicting objective; as long as Volvo CE claims that the regeneration and remanufacturing of genuine used parts and engines provide excellent performance, notably equal to that of a new part or product, it is only logical to consider Reman as a true competitive alternative to the purchase of new products. How can Volvo CE carry out such a program considering these competing actions within the same firm? This study will try to answer this issue.

As mentioned above, the Reman product is environmentally friendly. By reusing resources, the strain on exploitation of nature is loosened (Jayaraman et al., 1999, p. 497). Further to this fulfilment, Reman also has a highly profitable gross margin, the average of which lies between 30-50% (Respondents E, P); it is important to note that the gross profit margin in reference to Reman shown in the figure 1 includes the range of the margins rather than the average margin (Respondents P, Q). Volvo CE claims that Reman could be responsible for 20% of the part sales volume (Respondents B).

1.2 Defining the problem: Reman in Russia

In short, Volvo CE’s main problem in respects to its Reman programme is a lack exploitation of the after sales market through the Reman offer. This issue can be tackled through improving the transferring of knowledge within the organisation. This study will attempt to combine internal knowledge with external sources, in order to possibly transform this organisational problem into a practical and strategic advantage. The issue with knowing when and how to implement and/or expand a Reman program is relevant for all manufacturing industries. This project focused on Russia as “restricted market”, and this choice is explained in Chapter 1.5.

Reman is not yet established in Russia, though its growing population of vehicles and the prediction that this number will only increase in years to come further nourishes the idea of establishing Reman in Russia (Respondents E). Section 4.2 of the Empirical Chapter and 5.2 of the Analysis Chapter will present all aspects and information of Reman in Russia, such as legislation and potential demand among others.

Figure 2 also shows Russia’s proximity to two main markets: the European Union (EU), and Asia’s “Chindia”, an acronym used to describe the two main markets of tomorrow, made up of China and India, combining over 2.5 billion inhabitants.
1.3 Research Question

To summarize all the issues which must be dealt with, this thesis will continuously address one simple question:

**In restricted markets, like Russia, what variables are necessary to define why and how Reman can be a possible alternative to buying a new product or simply repairing an existing one, and when are alternatives a better option?**

1.4 Purpose

The overall ambition of Volvo CE with this research is to stimulate the creation of a second opinion on whether Reman is worth the investment or not, quite specifically in Russia.

Our purpose for this thesis is to provide Volvo CE with important variables to consider, when deciding on the implementation or development of a Reman program in important restricted markets, such as Russia, which we have decided upon together with Volvo CE.

Our purpose for this thesis can be summarised in the following three points:

1. Describe the Reman emerging businesses in Russia; and
2. Identify relevant variables in a Reman program decision;
3. Identify and systematize Managerial Implications.

1.5 Scope and Delimitation

This study will partly discuss the competition’s activities in respect to their own Reman offers. As mentioned previously in the Chapter 1.1, Reman is *not* an innovative idea from Volvo CE, as it is conducted by most of its major competitors, for example Caterpillar and Hitachi among others. (Respondents B)

In order to choose which market to focus on, Volvo CE’s global investment intentions were analysed. Volvo CE was keen on a project focusing on Russia, and we as the authors recognized the Russian market's potential. Furthermore, we the authors decided to use another market as a reference and validating evidence for our findings throughout the research. After initial data gathering, it was conclusive that Russian restrictive legislation of international trade did not forbid the trade of used merchandise, but merely required careful documentation.

This study will therefore focus on Russia, a maturing yet complex and unexplored restricted market.

1.6 Thesis Outline

This section briefly explains the formation of the structure of this thesis, and how each section complements the next.

Figure 4 below illustrates the evolution of each part of this thesis. Chapters 1 to 4 (Introduction, Methodology, Theory and Empirical Data) are the foundations of this thesis; these areas are developed through research (Chapter 9, References) of basic information, methods and results of gathering empirical information, a theoretical framework which justifies the creation of new theories. These first four chapters allow for an intensive analysis in chapter 5, from which interesting but not entirely focused ideas and tools are displaced to the appendix chapter 10. The analysis leads to condensed conclusions and managerial implications in chapters 6 and 7, as well as ideas for possible future research in related topics.
1.7 Variables for Decision Making on a Reman Program

This study identified variables involved in the process of deciding upon the implementation or expansion of a Reman program.

These variables are explained in the Analysis Chapter 5.3.1, and are illustrated in Figure 4:
2 METHODOLOGY

This chapter explains the methods used while conducting data gathering, as well as the analysis of data and how these will be finalized into a model valid for Reman in restricted markets. This chapter starts with the research design alternatives, and then it goes into depth into the chosen methods of research.

The research question and the aim of study allow for a guide in choosing methods and other details in the method chapter and to the thesis work as a whole.

Any author’s position in a writing-process before any data gathering can be defined by using the metaphor of an “iceberg”. What was initially showed by Volvo CE was the tip of the iceberg, by announcing their problem: “To find at which point they can reach a situation where it is economically sound to introduce the Reman program on a new market (e.g. Russia)” (Respondents A). What were needed to define, in order to create a “solution” illustrated by a model, were the symptoms which were concealed below the “surface”.

2.1 Research Design

The distinctive features in studying two or more cases give an insight into various scopes or challenges and opportunities. This is possible to some extent while using comparison in order to gain a higher external validity and degree of generalisation.

Figure 5, Thesis Time Line (By authors)

Figure 5 above shows the intended research progress, in terms of which areas the study planned to focus upon and at which times, according to subsequent activities (travels, interviews, etc). The last part “Managerial Implications” refers to presented guidelines for future recommendations to Volvo CE. Figure 5’s label of “Case Study Sweden” refers to data gathering upon Reman as a general topic, not as a case study on Sweden to be presented in this thesis, but rather as a learning process in regards to Reman.

Figure 6 (extracted and modified from Sten Söderman, 2006) explains the process from which this thesis culminates to provide recommendations. It also stresses the value of in this case an academic thesis to show all steps to increase trustworthiness and make the process traceable. This logical sequence shows a process to:

- Identify the problem and situation upon which this thesis is based (1);
- Describe what has been identified through data (2);
- Understand and explain the problem by comparing theories with empirical data and then conduct analysis (3);
- Reach conclusions upon foreseeable circumstances based on the data analysis (4);
- Prescribe course of action to Volvo CE based on previous “logical steps” (5).
2.2 Induction Research Approach upon Theory

As stated in Chapter 1.4, the purpose of this study is to create a model, thereby generating new theory. This has led to using an inductive approach, where the study precedes from actual practical research findings, from which new theory is created (Bryman, 2001, p. 249, Merriam, 1998, p. 7).

2.3 Exploratory Research

An exploratory research method includes research which has not been done before, or at least not with the same perspective (Fischer, 2004, p. 140). There are various methods of data gathering in exploratory research, and this thesis has chosen to conduct its data gathering through the exploratory use of interviews and documents (ibid., p. 140). The documents used in this research are mostly internal documents with important corporate and industrial information. A timeline has been used to monitor how the variables (see in Chapter 1.7, Figure 4) change over time (ibid, p. 147). After the period of Case Study Sweden (see Chapter 2.1, Figure 5), it was possibly to categorise information into different variables, thus allowing for the structure of further interviews. The exploratory research allows the authors to use their previous experiences while interpreting the data, (for further details about cognition please see Chapter 2.6). This exploratory research allowed extensive interview material to be gathered.

2.4 Empirical collection method

Empirical refers to “knowledge based on observation or experiment, not on theory (Oxford Dictionary, 1994, p. 262). This approach makes it possible to “diagnose” a research problem, and these variables/symptoms are explained once they are identified. Since the problem originates from Volvo CE, there are no written theories specifically linked to their Reman issue. The data utilised in this research has been collected through observations and interviews, which are discussed in this chapter, section 2.9. In short, this study has been processed in the following manner (Bryman, 2004, p. 22): Observations / Results \(\rightarrow\) Theory

In short, various business theories have been considered in the Theory Chapter 3, in order to design a theoretical framework. Nevertheless, the main body of the Analysis Chapter 5 consists of findings and analysis from the extensive empirical data material collected through interviews and business cases (see Empirical Data Chapter 4).

2.5 Qualitative and Quantitative Strategies

Qualitative research method “requires a data collection instrument that is sensitive to underlying meaning when gathering and interpreting data” (Merriam, 1998, p. 1). In other words, “qualitative research is an effort to understand
situations in their uniqueness as part of a particular context and the interactions there (Patton, 1985, p.1 cited in Merriam, 1998, p. 6).

A qualitative method was chosen, further stressing that this thesis, although it covers several disciplines (finance, organisation, management, marketing, sales and more), has its strength in words and models, but not in numbers (Ibid., p. 5-9, Fisher, 2004, p. 53).

<table>
<thead>
<tr>
<th>Areas of Qualitative Research</th>
<th>Characteristics of Qualitative Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus on Research</td>
<td>Quality</td>
</tr>
<tr>
<td>Goal of Investigations</td>
<td>Understanding, description</td>
</tr>
<tr>
<td>Design Characteristics Sample</td>
<td>Flexible</td>
</tr>
<tr>
<td>Data Collection</td>
<td>Interviews, observations, documents</td>
</tr>
<tr>
<td>Mode of Analysis</td>
<td>Inductive</td>
</tr>
<tr>
<td>Findings</td>
<td>Comprehensive</td>
</tr>
</tbody>
</table>

Figure 7, Characteristics of Qualitative Research (Modified from Merriam, 1998, p. 9)

Figure 7 describes key characteristics of qualitative research, which apply to this research, thus making qualitative research the appropriate research method. The characteristics mentioned in the figure 8 above, all explain important parts of our qualitative research (Ibid., pp. 5-9).

A Quantitative research method could be seen as a research strategy which emphasizes a quantification of data when it comes to collection and analysis of data (Bryman, 2004, p. 35).

Quantitative methods were considered in this research, but such likely activities were by no means the ultimate driving force of this thesis, but merely acted as guidelines to defining important variables involved in managerial decision making.

2.6 Hermeneutic vs. Positivistic

This chapter explains why this thesis is written with a hermeneutic approach rather than a positivistic cognition method. In short, hermeneutic methods of research allows the researches to interpret findings and theories with own knowledge and experience, acquired outside of this field of research (Gilje et al., 2004, pp. 183-189).

As much as this thesis was originally designed to fulfil its purposes objectively, it proved invaluable to analyze the data gathered with the author’s own ideas and experiences, which originate from outside this research.

As all data gathered for this thesis came from people appointed by Volvo CE, eventual analysis was thus contaminated by irrevocably biased points of view. Bias in this context refers to the selection of respondents possibly providing distortion to the outcome of data analysis, which can influence the outcome of a thesis (Bryman, 2004, p. 119).

The theory of knowledge used was initially meant to be as real, certain and precise as possible under the circumstances i.e. Positivistic (Remenyi et al, 2000, Fisher, 2004, p. 15), but this was altered to carry out the research with a more hermeneutic approach, because of the subjectivity of biased data (Bryman, 2004, pp. 111-119).

Nevertheless, a hermeneutic approach allows thesis authors to combine collected data and analysis, together with personal understandings and past experiences, which were acquired outside the field of the research focus (Gilje et al., 2004, pp. 183-189), and interpret the findings as appropriate or desired (Andersson, 1979, pp. 23-25). Furthermore, the hermeneutic approach is a premium method in analyzing and retrieving understandings from immeasurable data, such as opinions (Gilje et al., 2004, pp. 183-189). The hermeneutic approach aims towards the understanding of interpreted data, thus acquiring knowledge on the researched issue (Gustavsson, 2004, p. 71).
2.7 Case Study as research design

*Case study* is the main research design the thesis. The case study is a preferred research strategy when a "how" or "why" question is being asked about a contemporary set of events over which the investigator has little or no control (Yin, 2002, p.5). Case Study provides an opportunity to generalise findings into theories for specific company-focus, rather than for all cases in the industry. (Ibid., p. 10)

Within the Case study design the Multiple-Case method was chosen (Ibid., p 46-47, Merriam, 1998, p. 40). The reason to use several cases is to use the distinct advantages of comparison in order to add value and credibility to the research (Henriott & Firestone, 1983, p. 14-19). The distinctive features in studying two or more cases give insight into various scopes, challenges and opportunities. This is possible to some extent while using *comparison* in order to gain a higher external validity and degree of generalisation; references from Europe were used to some extent, but these rely on information especially from Russia.

2.8 Interviews

This thesis consistently based its models and assumptions on empirical data collected from Volvo CE in Sweden and Russia. The desired information was gathered from archived files on the internet and in Volvo CE’s premises, concerning Reman’s historic performance, as well as during interviews with Volvo CE personnel and customers in Sweden and Russia.

According to Merriam (1998, p. 71) most of if not all information in a qualitative research are obtained through interviews. Person-to-person interviews were the only kind used in this study, as these allowed for further discussion on specific topics of expertise particular to each interviewee (Merriam, 1998, p. 71). Some interviews included more than one interviewee, with the purpose of a developed discussion with a “purpose” to brainstorm (Dexter, 1970, p. 136).

There are three types of interviews: structured, unstructured, semi-structured and structured interviews (Bjerke, 2003). Unstructured interviews were not carried out in this study since it would have widened the scope of interest outside the field of research. While trying to build a model for the successful implementation of a Reman program in restricted markets, the interviewees were asked questions directly linked to this Reman issue. A Structured interview narrows the scope of discussion, thus why this method has been chosen.

*Semi-structured interviews*: these are interviews where several topics are taken on by a number of questions, but the questions are freely formulated according to the flow of the discussion. (Ibid.)

Considering that interviewees may have ventured into moulding the answer to their liking, carefully designed questions were used, which provided needed information for the research while allowing the interviewee the flexibility of open-ended questions (Merriam, 1998, p. 75).

Several pilot questions were sent to the initial contacts in Volvo CE (all Respondents), making sure that the method of formulating questions lead to a desired answer in subsequent interviews (Merriam, 1998, p. 76).

Quantitative research questions aimed to find out numerical data about the financial situations (sales, costs, demand, etc) of Reman in the Russian market. The quantitative part of this research was carried out through a structured part of the interviews (Bjerke, 2003).

While conducting interviews, the focus was on the most important topics of the study and at the same time the weaknesses of interviews such as biases with responses or selection of questions were considered (Yin, 1994, p. 80). These weaknesses were bypassed by using semi-structured interviews and without giving too strong directions.
2.9 Validity and Reliability

This means that the choice of respondents is critical. The organisation who requested this study, Volvo CE, also supports in the choosing of respondents. This is both an advantage and a disadvantage at the same time, as the right people may be appointed as good interviewees, while these interviewees may have been chosen for their similar views on the topic, thus generating a unanimous consensus on the issues of this study (Yin, 2002, p. 62).

Russia was the main focus of this study. This allowed for the opportunity to get a more accurate idea of the possible outcomes from Reman in Russia.

The external reliability (the possibility to repeat the final result of the research within the entire research society) could have been complicated since the replication this study focused upon empirical data which can be complex to replicate when doing interviews with people (Ibid., p. 257).

This study’s aim is to do both the collection and analysis together to accomplish a higher level of internal reliability (the possibility to repeat the final result of the research within the research team) (Ibid., pp. 86-88, 257).

Validity tries to measure how accurately or frequently an indicator is measuring the factors which it was designed to measure (Ibid., pp. 88, 89).

Internal validity refers to the possibility of a conclusion resulting from a causal relationship between two or several variables. The internal validity suffered in the collection phase from short interviews. This was complemented by telephone interviews to bridge eventual gaps (Ibid., p. 44).

External validity refers to the likelihood of the concluding findings of this study becoming applicable to different cases in different times, industries and countries. Regarding the external validity, this study’s objective is to focus upon Russia as a restricted market, with Sweden as a complement with additional empirical studies. This study will focus on one organisation and a limited product line, which in this case will probably be sufficient to generalise the final results and also to extend them within the organisation in other restricted markets with similar problems (Ibid., pp. 44).

2.10 Alternative Research Methods

Every issue has solutions of two dimensions: theoretical and practical. This section explains three alternative methods and explains their characteristics, upon which are based the decision of research methods (see Verdicts on Alternative Methods Chapter 2.10.4)

2.10.1 Theoretical Study

A theoretical research method is simply explained by predicting the future through analysis of theories. In particular concern to Volvo CE’s Reman issue, this thesis could have been based on books, academic findings and acknowledged theories, as well as strategies used in previous market-entry scenarios by Volvo CE and its competitors. The downside of this method is linked to its unrealism and outdated perspective on current and practical circumstances (Bryman, 2004, pp. 356, 357). Furthermore this method would not make the utmost use of Volvo CE’s staff and their invaluable experience which is not referred in any written reports (ibid., pp. 371). This method can be combined with either a quantitative or a qualitative case study, as explained below.

2.10.2 Quantitative Case Study with Interviews and Surveys

Quantitative researchers measure various phenomena, and the research involves mainly the verification of theories (ibid., pp. 33-34). Data can be obtained through databases and surveys. This method emphasises the quantification when analyzing gathered empirical data (ibid., p. 35). By using quantitative information relating to Volvo CE’s (and possibly to its competitors’) activities in other markets, it is possible to get a clear view of market reaction and the concerned
new market’s own reaction to a hypothetical implementation of e.g. Reman. On the other hand, markets have unique characteristics, be that economic instability, cultural differences, or political implications, which would cause different outcomes. This data analysis alternative would also be based upon historical and retro perspective information, perhaps not fully applicable to Volvo CE’s future operations. Emphasising the difficulty in using quantitative case study as a sole research method, the changing market environment creates unpredictable and undesired results, whose validity challenges the reality of the situation (ibid., p. 43).

2.10.3 Qualitative Case Study with Interviews

A qualitative case study allows for data gathering through interviews, and the results of analysing these might generate new theories; it emphasises words and not quantification in the gathering and analysing of data (ibid., p. 34-35). A qualitative research method comprises unique advantages: the gathering of information directly from the sources. The sources in this study are mainly Volvo CE’s employees, and these allows for combined information from separate divisions within the same organisation. The downside of this method involves normal obstacles to meeting face to face with respondents: conflicting schedules, absence, different locations, etc. As researchers, we are perhaps directed to bias personnel, who may not possess the same points of view as others involved with the same topic of this study (Yin 2002, pp. 95, 96). As such, information may be inaccurate, inconclusive and not shared among Volvo CE’s staff, but merely among a few minds.

2.10.4 Verdicts on Alternatives

The theoretical study alternative has been ruled out. The reasons are:
- This study aims to be objective in using existing knowledge within the organisation and its members; this method cannot provide this benefit.
- This theoretical method does not allow confirmation of historical data from primary sources, which is a more preferred data-validity tool.
- Historical data does not take into account current events, which is vital for the provision of accurate recommendations.

The method of quantitative case study with interviews and surveys alternative has also been ruled out; it could nevertheless complement this thesis with some of its aspects. The reasons are:
- Historical data provides a great insight into previous outcomes, but just as the theoretical alternative, it is not up to date with current events to provide Volvo CE with accurate recommendations. Nevertheless, these historical keepings may prove valuable in this study.
- This alternative method makes it difficult to take into account differing cultural, political and economic environmental issues.
- This method is for verifying theories, but does not assist in the creation of new theory, which is an objective of this study.
- This alternative would be very appropriate if Volvo CE only wanted to find a break even point for the implementation or expansion of a Reman program; it is however not the case of this research.

The alternative of qualitative case study with interviews has been chosen. The reasons are:
- It allows the analysis of historical and current date, from primary and secondary reliable sources.
- It takes into account knowledge and experiences within the organisation.
- Environmental issues within the markets which Volvo CE wishes to enter can be analysed and taken into consideration.
- The purpose of this study is to generate theories and to create models which may come of assistance to decisions involving remanufacturing issues, and this method makes this possible.

It is important to note, however, that this research will include quantified empirical data as a set of tools to generating managerial implications on the issue of implementing or expanding a Reman program in Russia.
3 THEORY

This chapter covers the different theories utilised in this study, concerning Remanufacturing, Environmental Awareness and various Market Entry theories.

3.1 Remanufacturing

An academic definition of remanufacturing (Reman) in the literature reads: “Remanufactured products are typically upgraded to the quality standards of a new product, so that they can be sold in a new product markets” (Savaskan et al, 2004, p. 239).

The “economical and environmental benefits of product remanufacturing have been widely recognized in the literature” (Savaskan et al, 2006, p. 1). Despite the sustainable objective of Reman to “recover the residual value of used products [by remanufacturing these at a resulting] lower cost than the initial production cost... consumers value remanufactured products less than new products” (Debo et al, 2005, p. 1193), thus partially challenging the statement that the benefits of Reman are equally recognized in literature and in practice (Savaskan et al, 2006, p. 1).

When setting a monetary value for remanufactured products, it is important to take account of all the different costs involved, and how these are decided upon. For example, machine cores is a component of any engine, new or Reman, and their market price may in theory be altered, thus increasing the costs and prices of ordinary products. This is possible since the new product is no longer a single-use product (Debo et al, 2005, p. 1103).

There is a logistical challenge with the swing system, which is a reverse supply chain of, where the customer will be the one supplying the producer with components of production (i.e. used components) (Savaskan, 2004, pp. 239-240). In an internal perspective, this closed-loop of machine cores causes cannibalisation “of the established firm’s existing businesses” which sell new equivalent machine components (Cassiman, 2006, p. 262).

“Among other results, we found that if remanufacturing is very profitable, the original-equipment manufacturer may forgo some of the first period margin by lowering the price and selling additional units to increase the number of cores available for remanufacturing in future periods. Further, as the threat of competition increases, the OEM (Original Equipment Manufacturer) is more likely to completely utilize all available cores, offering the remanufactured products at a lower price” (Ferrer, 2006, p. 15).

3.2 Sustainability and Competitiveness

When a firm is not a market leader, such as Volvo CE’s case, it must “[condition itself] for attacking the [market] leader” (Porter, 2004, pp. 513-514). Porter clearly states that for a non-market leader to hold any means of attacking a market leader, it must first possess the 3 basic means to exist and resist. These are:

1 – Sustainable competitive advantage;
2 – Proximity in other activities; and
3 – Some impediment to leader retaliation.

The first point refers to a non-leader firm being able to positively distinguish their products from the market leader’s products in terms of product cost or differentiation. The second point means that the challenger must meet the same production-cost level and quality level to that of the market leader if it wishes to resist leader retaliation at any point. The third point leads to the eventual conclusions that a market leader could, for example, slash their prices to attack a market challenger, but the challenger must have means to counter resist such forms of retaliation. If a firm doesn’t fulfil these basic conditions for challenging the market leader, it is still possible to cash in on the leading competition with a performance focused upon harvesting (Ibid., pp. 11, 513-517).
On the issue of positively distinguishing a challenging firm’s products from the market leader’s products, Volvo CE can benefit from one relevant method to translate these variables into profit:

“Distinctive competencies are used to create a differentiated product […] which cannot be matched by the competition, and for which the customer is prepared to pay a superior price. Profit potential derives from a premium price” (Van Der Hejden, 2005, p. 71).

3.3 Political and Economic Environment

“The environmental factors are external to the firm and thus uncontrollable variables in the foreign market. [A national government’s] control of exports and imports [(concerning products and concrete investments)] is usually based on political and strategic considerations” (Hollensen, 2004, p. 498). In other words, unless the firm in question is an extremely large, politically and economically influential organisation, these environmental variables are uncontrollable. Nevertheless, these need to be taken into consideration before entering a market, as to manage and avoid unnecessary risks and costs.

3.4 Natural Environment

“Recoverable product environment are becoming an increasingly important segment of the overall push in industry towards environmentally conscious manufacturing” (Jayaraman et al, 1999, p. 497).

Reman is often linked with natural environmental awareness issues (Internet C), as an important business concern. Hans Jansson states that environmental care is one of the largest areas for CSR (Corporate and Social Responsibility) activities [where] Multinational Corporations are rather proactive (Jansson cited in Söderman, 2006, p. 142-147). Such corporate behaviour could be attributed to legislation, but also linked to corporations preparing themselves for smoother adjustments to future rules and limitations. Corporations experience the creation of a natural value together with societal advantages, thus explaining the current corporate drive and determination to act accordingly with the environment. This phenomenon is witnessed worldwide, through activities often envisioned in companies’ “vision”, “values” or “mission statement” (Söderman, 2006, pp. 138-145). The political leaders of the G-8 (the biggest 8 economies in the world) for example, are often pressurized by NGO’s (Non-Governmental Organisations) such as Green Peace among others, to focus on the reinforcement on legislation for pollution reduction (Internet C).

3.5 Market Entry and Expansion

Markets are different, and an identical commercial campaign in two different markets can result in opposite outcomes. For this reason, one market entry cannot be universally chosen by a firm, but rather adapted to entering each new target market. Literature explains that to take a phenomena (like Reman) and “take it out of the context and compare it with a notionally similar phenomenon elsewhere (also out of its context), […] you finish up with a comparison […] neither of which is then being studied within its own societal frame” (Söderman et al, 2006, p. 22-23). This can lead to the finding of facts, but to no understanding of the reality (Ibid., p. 23).

Such complexities involved in choosing a suitable market entry mode can be illustrated by legislation in Russia, which restricts the trade of “used” merchandise, such as remanufactured components. In theory, these restrictions aim to protect the consumer from faulty or low-level performance machines. More realistically, these restrictions act upon a protectionist government behaviour, where the state wishes to prioritize the progress of national businesses, or to attract foreign investment in establishing new businesses in the country (Krugman, 2006, p. 208 and Hollensen, 2004, p. 15). “A target market’s legal system can […] influence the choice of entry mode” (Wild et al, 2006, p. 393). Hollensen clearly states that “legislation can hamper the development of [manufactured or remanufactured product sales]”, such as Volvo CE’s (2004, p. 545). Furthermore, legislations can “force” entrants to pursue direct investments and produce in the country of interest.
When a multinational firm decides to enter a new (restricted) market, it will undergo a process referred to as “Foreign Direct Investment” (FDI), where it brings money into the country for investment purposes. Considering the integration within emerging markets, an often forgotten issue is whether or not markets desire FDI. Japan and China’s previous situations in terms of FDI are comparable to that of Russia within its own context. Gordon Redding mentions Japan as an emerging market which disregarded FDI as a need or want, while China was desperately trying to attract the same investments (Söderman et al, 2006, pp. 16-17). On this note, it must be remembered that Russia needs and seeks FDI for its economy.

For a matter of simplicity, this study analyzed different business areas based on Michael Porter’s Value Chain (1985) illustrated in Figure 8.

![Figure 8, The Value Chain (Extracted and modified from Porter, 1985)](image)

The entry modes described below make reference to Figure 8’s business areas which can be transferred into a market from the home company.

*Sales subsidiary*: in this strategy, a company performs the first three stages of Michael Porter’s Value Chain (1985) at headquarters or equivalent. The Sales and services part of the value chain are conducted in the restricted market, though only the sales and services division which deals with this specific targeted restricted market. A fully owned foreign sales subsidiary provides the firm’s headquarters or equivalent complete control of all sales and services functions carried out by the firm, in accordance to local laws and regulations. In Volvo CE’s case, “the nature of the product… is technical and complex in nature and [therefore requires] a lot of servicing [and] supplying of parts… A more permanent foreign base is needed” to perform these tasks more cost and time efficiently (Hollensen 2004, pp. 337-338).

The sales subsidiary strategy allows manufacturing companies to maintain full control of operations in targeted restricted markets, though with a limited access to the local markets due to both international and domestic restrictions to movement of goods (Ibid., p. 346).

It is important that the distributor (or dealer) has the possibility to provide after-sales service and support to customers when requested, as well as receive support from the manufacturer in order to carry out its functions (Söderman, 1994, pp. 48-57).

There are two other entry modes which Volvo CE may choose to utilize in the future. These two entry modes belong to Hierarchical Entry Modes (Hollensen, 2004, p. 336) and are: *sales and production subsidiary* and *transnational organization*.

*Production and sales subsidiary*: this strategy involves the same aspects of control as a sales subsidiary, but with an added physical production plant, thus lowering transportation costs, as well as many tariffs and restrictions when trading across national borders.

When using the production and sales subsidiary entry mode, it involves high risks in two perspectives of the market: political and financial (Ibid., p. 346). There is a political risk involved in this entry mode because a stable government is necessary for long term commitment within the market. Furthermore, there is a great deal of money and staff involved in this entry mode, a risk which an investing company must be able to manage (Ibid., p. 338).
Transnational Organisations: it may prove to be a profitable business decision to implement all stages of Michael Porter’s Value Chain (1985) in the target market, in this case the restricted market of Russia. Such a move would be justifiable by a largely sufficient market, both through domestic trading and exporting globally. This “attempt to coordinate and integrate operations across national boundaries so as to achieve potential synergies on a global scale [is an objective of multinational firms]. Management views the world as a series of interrelated markets. At this stage, the employees tend to identify more strongly with their company than with the country in which they operate” (Hollensen, 2004, p. 342). In other words, the establishment of transnational operations is a stepping stone to global market penetration, in commercial perspectives relevant to the industry and firm.

Transnational organisations face the threats of continuously increasing bureaucracy, together with increasing responsibility to its growing number of employees and clients worldwide, thus breaking down communication channels. In the face of so much compulsory processes, a national or area manager may seem powerless to promote and establish any positive change (Ibid., p. 346).

3.6 Wholly Owned Subsidiaries

Volvo CE operates with wholly owned subsidiaries; these deal with Volvo CE’s administrative tasks within a market. There are two ways for a transnational organisation such as Volvo CE to set up wholly owned subsidiaries in a new country: Greenfield and Acquisition. Every company must balance between these “build versus buy” subsidiary establishment modes, in the search for higher efficiency and profits as well as lower costs (Frankel, 2005, p. 85).

- Greenfield involves the transnational organisation investing in building operations from scratch (Hollensen, 2004, p. 342). Greenfield gives the opportunity for the transnational organisation to start fresh and structure its activities on how to do things the company’s way. On the downside, there is a high initial investment cost of setting up this kind of subsidiary, costs which may take many years to be recovered through this new subsidiary’s profits (Ibid., p. 343, 346).

- Acquisition involves the transnational organisations “acquiring an existing company” to carry out its operations (Ibid., p. 342). An important issue within acquisition is the fact that along with the transferring of premises and operations, personnel is also part of the package. The main idea is not to “let [key people] jump ship”, but rather identify and keep them (Galpin, 2000, p. 103).

The Analysis Chapter 5 will complement these possible theories of market entries together with the Empirical Data Chapter 4's content, which reports all relevant findings of this study.
4 EMPIRICAL DATA

Information on Volvo CE’s activities and its target markets’ situations are presented in this chapter. These sources of information are mostly Volvo CE managerial employees, and have opposing views on the Reman issues discussed, depending on their location and branch. 19 interviews have been carried out, the results of which are shown together with secondary data, from business cases and business reports.

4.1 Russian Case

As the authors’ trip to Volvo CE’s Russian premises only took place in late April 2006, initial data gathering on Volvo CE’s activities in Russia happened in Eskilstuna, in Sweden in March. Respondents E were the authors’ Eskilstuna contacts in relation to the Russian case, concerning Volvo CE’s activities and the Russian market. Volvo CE operates in Russia under the official name of Volvo Vostok (Respondents F).

4.1.1 Market Potential

The Russian market in regards to construction equipment is established but highly underdeveloped relative to its potential. At the time of the capitalization of Russia, domestic construction equipment companies were the most attractive to consumers due to their rock bottom prices. Over the following decade, foreign producers showed Russian customers that a much needed quality of products comes with a higher price tag. The quality of products and services are directly correlated with machine reliability and downtime when repair or replacement is required (Respondents E). Customers understood this basic principle, and quality products now form most of the market.

The total market for construction equipment in Russia has been growing at an astounding rate of up to 30% a year, far greater than the Russian GDP growth rate of 6% on average for the same time period (Respondents F). This is a clear showing of the tremendous market potential.

Although Volvo CE has only been present in the Russian market since the late 1990’s, there is a reasonable population of old Volvo machines of all kinds (Respondents E, G). This is due to a transfer of machines based on a life cycle perspective. Parts of a machine produced in Sweden may be repaired, reconstructed or remanufactured, and sold to another market, and this process could have been transformed into a cycle, from continent, eventually landing in the former Soviet Union. Considering this process, some machines in Russia are in their third or fourth life cycle, in dire need of Reman; hence there is current potential on old machines (Respondents H). The only problem in the implementation of Reman for such old machines would be whether or not the consumer would be willing to pay the price for a Reman (Respondents S).

Russia is an endless field for further examples of market potential for construction equipment. Construction equipment companies have a warranty of presence in Russia because of another interesting issue: the need to build endless quantities of infrastructure. Mineral, Timber, Gas and Oil companies among other natural resource explorers, are operating their facilities to their full capacity, and constantly need to build new roads, new train tracks, new stations and the list goes on. To fulfil these needs, it is certain that the construction equipment industry will be present on this particular matter for a very long time (Respondents J).

When considering the market potential, there are two major risk and disadvantages to keep in mind (Respondents F, H):
1. The political stability could easily change into instability, in this case linked to the administration of President Vladimir Putin.
2. A high financial risk in regards to the problem of cash flow and payments from customers. This has and is a major concern to Volvo Finance.

4.1.2 Volvo CE Activities in Russia

Volvo CE started its official operations in Russia in 1998 (Respondents F). Volvo CE operates in Russia differently to the rest of markets under the International Division.
Through Volvo CE owned and privately owned sub dealers, Volvo CE gains some advantages of a high degree of control over marketing and sales. The decision to pursue this system came as a result of the difficulties in finding suitable partners that would invest to the standards that are required in distribution.

Volvo CE has premises both in Moscow and St Petersburg. In St Petersburg the new premises are shared between Volvo Trucks and Volvo CE where Volvo CE has its centre for their Sub Dealership (Volvo owned) for the North West Region. In Moscow there are two Volvo CE premises: the Head office in the north west of the city that is also shared with Volvo Trucks, and a Volvo CE sub dealership in the south east of Moscow. A new Volvo Parts Regional Warehouse will be open-ended in the summer of 2006 in the north west part of Moscow, close to the airport (Respondents F). There is no production line for Volvo CE in Russia, and all machines are supplied from Volvo CE factories worldwide, as convenient (Respondents E, G).

Making use of a sales subsidiary strategy in Russia, Volvo CE’s three initial business areas of Research and Development, Production and Marketing, are established in Volvo CE International Division, excluding Russia; Volvo CE only operates its sales and (limited) services division in Russia, though a (not fully exploited) marketing team is present in Russia (Respondents C, G).

4.1.3 Volvo CE Reman in Russia

Volvo CE under the name of Volvo Vostok offers individual Reman packages to customers when it is possible to overcome trade bureaucracies. There is great difficulty in achieving this, as numerous documents are necessary for the export/importing/transport procedures (Respondents E, F, G, H, I, see 4.1.5). As Volvo CE cannot yet fully provide the Reman service to all its customers, it does not openly advertise it, but only offers it when it is requested spontaneously by the customer. In an explanatory metaphor, Volvo CE’s Reman situation was described by one interviewee as: “if there’s sugar on the shelf, we’ll market the sugar”. In other words, until Volvo CE can meet potential demand for Reman, it will not market it.

The Reman program needs some additional man power resources to make it operational and these will become available once the new parts regional warehouse is operational together with the systems development and new parts distribution inside Russia. The few Reman sales that have been made have proved that it is possible to operate a Reman program through a trading system with Volvo CE factories worldwide (Respondents S).

4.1.4 Competitors Activities in Russia

Volvo CE’s competition in Russia is today the same as it is worldwide: Hitachi, Caterpillar, other western and East Asian manufacturers, and in addition to this, local manufacturers who often only operate domestically (Respondents E). Caterpillar offers a much extended Reman program elsewhere than in Russia. It has been tried in Russia, but not successfully, for three reasons:

1) The marketing team did not successfully explain the benefits of Reman to the consumer, who rejected the concept simply as an “old machine”. This mentality could take a “lifetime” to change, regardless of warranties and quality stickers (Respondents J), so they did not accept it;
2) The legislation did not prohibit the trading of used merchandise (Respondents H, J), i.e. the used cores and remanufactured cores, but it greatly difficulted this process and;
3) The most important point is that the population of machines (i.e. investment volumes) was not yet sufficient for a truly profitable Reman program in Russia (Respondents J).

Caterpillar has very extended Reman program with nearly all major components, “everything which is expensive and material intensive. It is no easy talk to import a Reman component in exchange for a used part”, which is a company policy at Caterpillar (Ibid.). Caterpillar has a strong division between manufacturer and dealer, and the Reman issue is a
dealer issue and dealers are privately owned. If the dealer does not comply with this policy of returning the worn out components in exchange for a Reman, he may be issued a penalty fee which makes Reman unprofitable. Given the amount of risk, many Caterpillar dealers prefer not to offer Reman as the customer may be unwilling to provide the worn out part in exchange at a small price or at all (Ibid.). Caterpillar has postponed (again) the opening of a regional warehouse near the airport in Moscow until 2007 (Ibid.).

4.1.5 Legislation

The Russia Government does not impose prohibitive restrictions upon the international trade of “used” merchandise, but rather imposes a bureaucratic impediment to this trade. Specific documents are required to certify the merchandise involved in the trade are eligible for trade. Such documents are hereby described as restrictions, since these procedures add unnecessary time to the trading process. These processes impose administrative costs, and can be augmented if there are irregularities in relation to the required documents (Respondents E, H, J, I, K).

Volvo CE currently deals with these legislative restrictions through broker companies at Russian borders. These facilitators utilised by Volvo CE are based in St. Petersburg (Respondents E), but these functions will soon be transferred to the Moscow branch (Respondents G).

According to Russian law, it isn’t prohibited to re-export a product that has been imported into Russia and used locally. However, when the core of an engine is directed to Volvo CE, there are certain rules as to the cost of transaction. Every company involved in the transaction and exchange of the engine must pay for the used core, as the commodity must have a value stipulated to it. “Gifts” are not allowed; a customer must sell his used core at a price higher than its cost, as to make an obligatory profit on it. Along the same lines, when a core is exported to, i.e. Sweden, the tax on the core can be recovered; if the process has been carried out accordingly with rules of procedures, and that all documents involved in the procedure (invoices, exporting contracts, official authorization of transaction, etc) are presented, the 18% VAT on the product will be returned to Volvo Vostok (Respondents H).

4.2 Variables Identified

There are specific factors, or variables, which have an influence on every decision a company makes. For the implementation of Reman, this study found several variables which were recurrent throughout the data collection period, and these factors are:

Level of Restrictions, Range of Components, Critical Mass, Age of Machines, Usage of Machines, Cultural Acceptance of Reman, Government Acceptance of Reman, Customer Education of Reman, Costs of Exporting/Importing Used Components and Reman Components, Costs of Transportation of Used Components and Reman Components, Costs of Adding Reman to an Existing Production Plant, Costs of Setting up a Production Plant with Reman, Market Potential, Market Stability, Market Strategic Importance, and Decision.

The Analysis Chapter 5 analyses the empirical data presented in this chapter, and attempts to apply theoretical foundations to these in order to create recommendations. The above variables are further explained in terms of significance and importance in the Analysis Chapter 5.3.1.
5 ANALYSIS

This chapter analyses data gathered, and proposes a joint view on all different aspects previously discussed for the Russian case.

5.1 General Analysis upon Theories

The method chapter explains the choice of research methods for this thesis; the combination of hermeneutic and exploratory and qualitative research methods, together with the biased statement that there is no real opponents to the Reman program within Volvo (Respondents M), will undoubtedly influence the final outcome of this thesis’ data analysis and conclusions (Bryman, 2004, p. 119).

Remanufacturing has been proved to be very important for economical and environmental reasons (Jansson cited in Söderman, 2006, p. 142-147). It incentivizes a more efficient and less costly use of resources, thus creating competitiveness, and inclining industries towards greater sustainability and resources preservation.

For a firm to challenge its competitors it must uphold its Reman program as a competitive advantage, both in terms of quality, availability and range of Reman products. When a manufacturer holds the premium price in the market for new products, it should aim to hold an equal position in the market for Reman products.

Markets are different, and each must be approached in unique and appropriate fashion, in order to overcome legislative and economical barriers to commercial activity (Söderman et al, 2006, p. 22-23).

The Russian establishments of Volvo CE as Volvo Vostok, engages in Marketing and Sales & Services activities in their market. Research and Development is undertaken by Volvo CE Sweden. In other words, Volvo Vostok’s activities can be explained by both establishments engaging in more activities than simply a Sales Subsidiary, but not fulfilling the requisites for qualifying as a Transnational Organisation (Hollensen 2004, pp. 337-338, 346). Concerning Greenfield and Acquisition modes, Volvo CE should consider both of these set up/expansion modes in order to choose the best strategy for each individual business scenario (Ibid., p. 342-343, 346).

Starting or expanding a Reman program in Restricted Markets, such as Russia in this case, is an important strategic decision, as it may be crucial in the development of Volvo CE in these target markets’ construction equipment industry.

To keep the sustainable objective of Reman a company can “recover the residual value of used products [by remanufacturing these at a resulting] lower cost than the initial production cost, [however] consumers value remanufactured products less than new products” (Debo et al, 2005, p. 1193). Nevertheless, this offers a great potential profit for a manufacturing company, while selling remanufactured merchandise with high profit margins and improved value to the customers at a lower cost. It is therefore logical to conclude that Reman adds a competitive edge to a manufacturer.

In a country such as Russia, where there is great potential for growth, it is unlikely according to Hollensen, that a sales subsidiary will be sufficient in the long run. Local demands will with time request local production, as it is seen as an investment in long term establishment in the market (Hollensen, 2004, p. 338). Manufacturing firms may choose not to expand the number of production facilities worldwide, because of facilitating logistical solutions; it could however prove much more profitable to set up production lines in highly demanding markets than referring demands to nearest production centres. This could be the case in Russia for many years to come (Respondents M). Thus applying theory, establishing a production and sales subsidiary in due time in the growing market (e.g. Russia) will be an important decision with strategic consequences for the investing firm (e.g. Volvo CE).
5.2 Russian Case

First and foremost, Volvo CE is not a first mover in the market, nor is it a late entrant, since it has established itself in Russia in 1998.

Volvo CE estimates its current machine population in Russia to be too low for the implementation of a production plant, let alone for a Reman line within this hypothetical plant. The Russian market poses good potential, in terms of growth rates and population, for the coming years, and Volvo CE may decide in time to set up a manufacturing plant in Russia, rather than just warehouses, customer centres and dealer shops (Respondents F). It is important to emphasize the minimal distance between Russian borders and Volvo CE’s Swedish manufacturing and remanufacturing factories. If restrictions are dropped to EU levels, then it would become effortless to export products to Russia rather than producing or remanufacturing them there. On the other hand, if restrictions are dropped to EU levels, assuming that cost levels remain the same, then it might become much more cost-efficient to produce, sell and distribute Volvo CE products, both new and Reman, from Russia to EU and the rest of the world (Respondents G, L). Furthermore, it will be very convenient to specialise both the Swedish production plants and hypothetical Russian plants to different processes.

Despite these restrictions, it is possible to export used products and import Reman products to Russia i.e. it is possible to use the original “swing” process with a return of cores in exchange for a Reman product. Nevertheless there are restrictions that add additional costs and time. These consist of additional personnel, the possible necessity of a computerised Core Management System, premises for storing used cores to send in large batches to e.g. Sweden, and costs of having Reman products in stock in Russia. The additional time is for administration and storing both the used products in Russia and the Remanufactured products in order to decrease the transportation costs.

One solution in the short run seems to be to sell the used parts in a reverse supply chain (customer-sub dealer-dealer-storage in Russia and then in a large number sent off to Sweden). Important here is to sell each unit at a reasonable cost to fulfil all rules and legislations and make the export possible (Respondents H, L).

Since Reman is not offered at the moment in Russia by competitors, Volvo CE doesn’t have to sell Reman in the same way as they are “forced” to in other markets (Respondents G). If Volvo CE wants the same after sales support, it should offer products at a similar price level of different markets. Reman can be very profitable but this is not necessarily the case; depending on the amount of Reman units sold, which is linked to the number of machines in the market, and also the kind of machines since it is not offered for all models, the resulting profit will be different. With the current economical situation and machine population in Russia, it is not economically sound to set up a production line. With the current sales growth rate, it will take more than 5 years until the machine population reaches a “break even point” for setting up a production plant (Respondents B, H).

The current focus in Volvo Vostok in Russia is to expand the current activities, and establish an organisation for after sales support of spare parts and services. An option for major customers is to hold a workshop on their premises with Volvo CE’s personnel, who are employed to provide this service support. Another option is to have a dealer or sub dealer who provides support for customers within 400 km or approximately 10 hours-driving distance (Respondents M).

There are few pirate (counterfeit) spare parts available in the Russian market, thus Volvo CE machines can almost only be serviced and supported by Volvo Vostok, through its dealers (Respondents I). As competitors don’t offer Reman at any significant scale in the Russian market, Volvo Vostok as of now needn’t rush to offer its Reman products at a larger scale. Volvo Vostok could therefore take full advantage of this situation and educate theirs customers on one very interesting characteristic of their offers: since the products’ core can be sold off back to Volvo Vostok after a usage period, the actual perceived price of the machine is lower, as are its averaged running costs over a time period. Thus, a Volvo CE customer would not only be in possession of a premium machine, but also of a price-justifiable product – marketing departments within Volvo CE should therefore make full use of this characteristic through a continued education for dealers and customers. These two groups of people vital to Volvo CE’s existence drive Volvo CE’s most
powerful marketing tool: word of mouth (Söderman, 1994, p. 57). Increased knowledge among customers, dealers and Volvo Vostok sales personnel leads to higher activity and productivity, amounting to more ambitious business targets to be reached (not considered before due to lack of product knowledge). In this case of higher education among parties involved in business transactions, a sales deal of a wider product range (including Service Contracts, see Chapter 4.2.3) can be used in order to cut costs, as Reman can be used within the Service Contracts to cut costs (Ibid., pp. 57, 58).

Volvo CE pursues a sales subsidiary strategy in Russia. Through this process, Volvo CE can also acquire experience and market knowledge at relatively low risk, while creating important contact with potential customers. Nevertheless, this entry mode poses many disadvantages for Volvo CE in terms of costs and prices. Volvo CE already boasts of high prices because of its high quality differential to competitors, and once tariffs and other administrative costs are added on top, Volvo CE places itself as a price setter for the high-end market, which may not always be a viable option for a customer with a restrained budget.

The current focus for Volvo CE in Russia is to expand the current activities and establish an organisation of after sales support and services to provide support within 400 Km of where the main machine population is centred in Russia. Where a customer is in a remote part of Russia and the machine sales quantity is sufficient then Volvo CE will provide project service support in the customers’ premises.

The high costs and prices of the above process may still be lower to those of setting up a production line in Russia. Once restrictions are dealt with, Volvo CE eliminates the costs of a production line which at current unsustainable levels of demand would prove financially ill. When considering the possibility of implementing a sales and production subsidiary strategy in Russia, the Russian market could allow for the set up of an exporting base, and Volvo CE in Russia could expand its presence across two or more levels of Michael Porter’s Value Chain. (1985).

A pressing issue for Caterpillar in Russia concerns its second postponement of its Moscow warehouse opening. The longer it takes to open for business, the more of the market share it will lose, as it is a strategic point of business in terms of competitive advantage. Volvo Vostok, with its soon-to-open warehouse in the vicinity of the Moscow Airport will gain a competitive edge to Caterpillar’s grip on the market (Respondents J). This newly acquired advantage for Volvo Vostok can serve as a strong motivator to its sales force.

5.3 Generic Models illustrating the Russian Market

In order to analyse the data gathered, several models were drafted, models which may support Volvo CE’s decision to implement Reman successfully in a market, based on their perceived abilities to do so.

5.3.1 Variables Identified and Analysed

The variables identified in chapter 4.3 have been put together in a pyramid illustrated in Figure 4, which is also present in the Introduction Chapter 1.7:

![Figure 4, Variables Influencing the Decision Making Process on a Reman Program Implementation (By authors)](image-url)
Figure 4 identifies several levels of importance and chronological order (verified by Respondents Q, R), which are not less important than the other levels based on the level number (level 1, level 2, etc) but rather on the task in each level. These are explained below:

*Level 1:* finding out Volvo CE’s market penetration and its products’ condition in relation to Reman readiness. This level is the foundation of a decision on implementing a Reman program.

*Level 2:* identifying official and unofficial restrictions to a Reman program. Official restriction would be laws, whereas unofficial restrictions refer to customers rejecting the benefits of Reman because they are not educated and informed on its advantages, both in terms of business and environmental perspectives. In other words, this level identifies qualitative obstacles to implementing or expanding a Reman program.

*Levels 3 to 6:* identifying costs and investment alternatives in the implementation of a Reman program. These levels identify quantitative obstacles to implementing a Reman program.

*Level 7:* isolating the success potential of a Reman program and assessing investment risk in a target market.

*Level 8:* defining the importance of implementing a Reman program in a target market concerning Volvo CE’s global strategy. A market’s potential is not the same as a market importance. A small market for example may have great potential, but may be irrelevant to a company’s objectives. The strategic importance of a specific market is dependant on demand as well as competitors’ activities.

*Level 9:* based on all the previous levels, a decision must be made on whether to implement, how to implement, and when to implement a Reman program.

These variables have been applied to the Russian case, as explained below, where L1, L2 etc. refer to Level 1, Level 2 etc. shown in figure 4.

L1) Range of components is not sufficient for local production within next 5 years when critical mass of over 10000 machines should be exceeded (Respondents L). The usage and age of machine will need actions sooner than that.

L2) Restrictions are possible to overcome (Respondents H); there is a need and desire to educate staff and customers about Reman to overcome cultural and customer reluctance.

L3) Costs of import/export should be acceptable (Ibid.).

L4) Transportation is mainly made through rail and roadways; costs are low (Respondents G, S).

L5) There is a Volvo Trucks production facility as of today, but not a Construction Equipment plant. Local suppliers of certain components, such as Bosch (Respondents H, I) could provide remanufactured components for Volvo to sell it as Reman to its customer, but this is unlikely. Volvo CE in Russia can therefore only consider the option of setting up a Reman production line in Russia (Respondents S).

L6) Considering lower costs of production to current production plants and also considering the growing demand in the Russian market, could be a very interesting idea in the long run (Respondents L) but doubtful that this may result in the set up of a production plant in Russia. Maybe if growth rates continue rising and production costs remain low, this option might be interesting (Respondents S). Furthermore, locally produced goods are well accepted by consumers, especially when it is a world renowned brand, such as Volvo CE (Johansson and Näverfelt, 2004, p. 149).

L7) Market potential is very high, Political stability could be questionable (Dagens Industri, 2006, p.4).

L8) Russia is a market of high strategic value where sales of international high quality machines increase every year both in percentage terms of market share and also total sales figures (Respondents F).

L9) This data analyzed as above will support the decision to implement a Reman program. The Managerial Implications Chapter 7 presents possible decisions.

### 5.3.2 Reman Readiness

After the data collection period in Russia, the decision making process on introducing a Reman production plant was simplified with very specific questions on the main factors affecting such a decision, and this process is illustrated in figure 9.
The market in Russia imposed no legislation that prohibited the trade of used merchandise, but merely legislation that complicated the trade of used merchandise (Respondents G, H). These complications can be solved through the set up of standard procedures undertaken by Volvo Vostok, Volvo CE and customers in order to make the trade of Reman and used merchandise possible. It is only a matter of successful management.

The first question in Figure 9 refers to whether or not “Reman [is] an acceptable offer to a New Product”, and it deals with the issue of customers being aware of the Reman offer. Volvo CE needs to educate its Russian customers on the name as well as on the remanufacturing process which is new in Russia, in order to relate the process to the unique brand of Volvo CE products which are remanufactured in Volvo CE’s own factory only, and with a warranty identical to that of a new product.

![Diagram](attachment:image.png)

*This is not yet an offer by Volvo CE, but should be considered.*

**Figure 9, Decision Process on Introducing a Reman Program (By authors)**

The flow chart in Figure 9 can be applied to the Russian case, as shown below:

Most Russian customers don’t appreciate the advantages of a Reman product yet, and should be educated on its characteristics, together with Volvo Vostok staff. Currently, these customers are offered appropriate alternatives, as shown in Figure 9. The few customers who are aware of the Reman offer and request it should be offered a Reman alternative, through trading channels with Volvo CE in Sweden or elsewhere. This opportunity to trade with limited customers allows for Volvo Vostok and Volvo CE International to put Reman trading standard operation procedures to practice, and further develop these in order to achieve smooth functionality. This “practice” should be suitable to prepare Volvo (or any firm in the same scenario) for a Reman trading system with a much larger volume of sales, and in this process Volvo Vostok staff will gain experience and realise the advantages of a Reman product.
When considering the decision of implementing a Reman program, the issue of cannibalisation of New Products Sales by Reman Product Sales arises. The next section explores and explains the advantages of combining this cannibalisation for mutual growth of both New and Reman Products.

5.3.3 Reman Sales vs. New Product Sales

When setting up a Reman production line, various costs are incurred, including testing facilities and recruitment of qualified personnel. When this investment takes place in a restricted market, such as Russia, there are additional costs involved in time-taking bureaucratic processes of documentations and licensing. A more Reman-related cost in the establishment of a Reman production plant in a restricted market deals with the issue of used-core availability. To start a “swing system” of used components for new components, the manufacturer must invest in the selling of new components marked as Reman, thus making a loss due to different prices between a Reman and a new component. This cost will decrease gradually, as the swing system starts up, but nevertheless, there will always be the need to sell some new units as a Reman unit, in order to keep the swing system running smoothly.

Reman sales will cannibalise the sales of new products; over time, Reman occupies a larger proportion of total parts sales volume. This process is nevertheless in the interest of new product sales, because along with the development of the Reman program, both sales offers become interdependent, and an increase in one will lead to an eventual positive result in the other in the long run.

When a Reman program is first implemented, there is a negative effect on cash flow because of initial investment, but these costs are covered in an expected time frame, considering that appropriate estimates on investment return are correct (Respondents E).

Considering that all cores can be remanufactured up to five times (unless these have are not returned to the manufacturer, or that these suffered considerable damage to the core thus invalidating these for remanufacture), the ratio of Reman cores to new cores could theoretically be near 5 to 1. Volvo CE therefore aims to reach in the next couple of years a 30% level of Reman sales to the total number of parts sales (Respondents G). The rate of growth of Reman sales can be increased even faster through marketing: the more customers know about Reman, the more they will demand it, as it is a good alternative. On this point, it may be said that cannibalisation of new products could suffer in the future, but there is no evidence of this. Instead, projections of new product sales show great forecasts.

Volvo CE’s competitors worldwide offer Reman alternatives to its customers. Therefore, it must be accepted at all times that Reman is not an option of product offering. It must be offered, otherwise the customer will find better customer support characteristics in the competition’s offers. If the Reman offer didn’t exist, there would logically be no cannibalisation on the sales of new components. Interestingly enough, the inexistence of Reman offers along with the inexistence of cannibalisation on the sales of new components would result in total sales being lower in the cannibalisation scenario, than in the non-cannibalisation scenario. In other words, the existence of Reman offers increases the potential for total sales in the customer-support market.

In summary, the cannibalisation of new product sales by Reman sales is existent, beneficial to manufacturing firms, and also necessary in other to retain customers and increase profits.

5.3.4 Market Entry and Expansion

A sales subsidiary as well as a sales subsidiary with a production line allows the investing company, in this case Volvo CE, to maintain a high level of control over operations (Hollensen, 2004, p. 346). With this control, however, comes a high investment cost involving potential risks (in economic and political perspectives), such as taxation issues with customs, and licenses for production. Nevertheless, this entry mode allows an entrance to the market, thus increased flexibility in the ability of communicating directly with local authorities and business partners.
A transnational organisation poses great potential for a long term establishment in the entered market, as it involves high investment costs for all levels of the Volvo CE business: Research and Development, Production, Marketing, Sales and Services (Ibid., p. 346). As Volvo CE is a very large international organisation, there is the risk of an ever increasing amount of bureaucracy and responsibility, towards its customers, employees, and business partners, as well as local authorities. Such problems can be transformed, through effective management, into positive synergies both for Volvo CE, the local and global market. This effective management can come from Volvo CE’s wide resources in terms of qualified staff to carry out the organizational functions, as well as passing on knowledge from one internal institution/employee to the other. All these gains could be inexistent, if the company fails to coordinate and communicate its goals and intentions at all levels of the organisation and engage the right people for the right job.

Transnational organisations as well as Sales Subsidiaries greatly depend on the strength of their brand names and reputation, as local governments and populations (customers, potential employees, business partners, etc) must accept its presence. This study has concluded that Volvo CE does not embellish the strength and quality of their name. Volvo CE is not a fully transnational organisation (in the context of Hollensen’s definitions, 2004) in Russia, and should not aim to be so. To understand this, take the example of a transnational organisation: it loses its focus of Research and Development when it is undertaken at a widespread geographical range – it is best for Volvo CE to maintain its Research and Development operations focused in limited and established centres.

Entering a market through wholly owned subsidiaries imposes a very difficult decision: build (Greenfield) versus buy (Acquisition) (Ibid., p. 342-343, 346). Building a local extension to an international organisation from scratch or expanding this international organisation through acquiring local companies both have common advantages: a high level of control over operations. Apart from that, these two entry modes are very different.

Greenfield offers the opportunity for an organisation to start fresh, and build everything from corporate culture, to premises equipped with the highest and latest technologies, with the right number and calibre of staff, thus increasing efficiency and lowering costs. Nevertheless, these qualified staff may be difficult or expensive to recruit, train and keep, while importing staff may be illogical if the local market demands high local knowledge. Furthermore, this entry mode imposes a risk on the time period in which the investment will be returned through profit. It is not yet justifiable to build a production plant in Russia, considering current sales figures, but this decision could be different in 5 years to come.

Acquisition offers the opportunity for an organisation to get hold of an existing functional business structure, with (hopefully) qualified staff with market knowledge and experience, as well as relevant contacts for business functionality. Nevertheless, these important people may be difficult to spot by an outsider, and may be head-hunted by competitors. Furthermore, the sense of being “taken over” can result in resentment towards the new incoming organisation, and result in numerous negative scenarios, thus emphasizing the importance of constructive and continuous communication between the acquirer and the acquired. Volvo CE could initiate itself in new markets, such as in Russia’s vast regions, through acquiring independent dealers and managing these as a branch. Moscow may be the capital and most commerce intensive area of the Russian market, but the centre and eastern areas would need greater support available from closer distances, and an acquired dealer could provide these.

5.3.5 Simplified Solutions

It is vital to the understanding of figure 10, to know that machine population and its respective growth refer to machines of similar or identical and compatible technical and mechanical components and characteristics - in other words, exchangeable units.

Figure 10 also refers to a scenario in a highly restricted market; in restricted markets where the trade of used merchandise is possible though difficult; and it also assumes that regardless of machine population, its growth rate and other factors, Volvo CE prefers to refer all Reman demands to nearest Reman centre instead of setting up a new Reman production plant.
The different variables when considering whether to implement Reman are: population of machines, growth rate of population, skilled personnel availability and presence of production line. Other important variables which the above graph indirectly includes are: investment costs, cash flow, and competitors activities. Political and economical instability are beyond Volvo CE’s control, and therefore are not taken into consideration in the above graph, assuming that these are not entirely uncertain. Below the variables shown on Figure 10 are explained; these variables are believed to directly influence the decision of whether or not to implement Reman in a restricted market.

Without a significant population of machines, there is no room for Reman. It’s as simple as that (Respondents O). It is not economically sound to establish Reman with the possibility of a breakdown in the “Swing” system of engine exchange, as well as lack of Reman demand in significant mass to justify the costs of production and investment.

The (sales and) growth rate is an early warning signal of population development and future demands for updates and repairs.

The population of skilled personnel; the implementation or expansion of Reman is a highly technical and complex process which requires experience and training in order to be carried out successfully and according to Volvo CE’s standards.

The presence of a production line is a prerequisite for Reman. The absence of a production plant makes it impossible for the Reman line to advance continuously, as some components need to be exchanged for new ones. If these are not present, they need to be imported, thus adding unnecessary delay to the production line. A production plant therefore adds the advantages of economies of scale in terms of logistical and administrative costs.

It is vital to the understanding of figure 11, that in reference to machine population and its respective growth, we are referring to machines of similar or identical and compatible technical and mechanical components and characteristics - in other words, exchangeable units.

Figure 11 also refers to a scenario in a highly restricted market; in restricted markets where the trade of used merchandise is possible though difficult; and it also assumes that regardless of machine population, its growth rate and other factors, Volvo CE prefers to refer all Reman demands to nearest Reman centre instead of setting up a new Reman production plant.

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Figure 10, 1st Model on Influencing Variables for Investment Decisions for Exchange Compatible Units (By authors)
Figure 11 explores two universal variables influencing the decision on the implementation of a Reman production line: Machine Population (of Compatible Models) and Machine Population Growth. This figure clearly shows this study’s proposed course of action in the face of 3 different Reman implementation scenarios; 1) In a market with high population of a same or limited model of machine, regardless of the growth rate (as long as there is a growth), Reman should be implemented; 2) In a market with a low population of machines but a rapid and increasingly stronger growth rate of machine population, plans of Reman implementation should be drawn and executed according to the market’s progress; and 3) On the other hand, if a market has a low population of machines and a very slow growth rate, this could be referred to as the “no go” option for a Reman plant. Instead, all Reman demands should be directed to the nearest Reman centre if possible, or as a last resort, Volvo CE can offer repair kits, overhaul kits, etc.

The two most important variables involved in the decision about Reman program implementation have been identified: population of machines and machine population growth. These two variables are crucial for a fruitful decision on the implementation or expansion of a Reman program, and hence, Figure 11 was designed to clearly illustrate the proposed solutions based on analysis, in its most simplistic format.

The Russian market finds itself in the top right corner of Figure 11, with a low population of machines which is not yet significant, but a very high growth rate of machines. Furthermore, the population of machines in this market is broken down into various different models, of all sizes and types, thus further complicating the hypothetical implementation of a Reman program as a production plant. Volvo Vostok in Russia should focus on establishing procedural steps for the formation of a swing system with its customers, and a Reman trading system with Volvo CE in Sweden.

5.4 Internal Communication affecting Reman Decision Making

An unexpected finding of great importance to this thesis refers to an invisible problem within Volvo CE in reference to Reman and its development. Communication channels between various levels of different departments in all locations are officially a great pool for sharing information. It is suspected from this research that many of the Reman issues discussed in this thesis, such as trade restrictions, are not agreed upon by internal departments. Information on same issues differs from office to office, and it shouldn’t, especially when this information is vital for a successful decision on strategic issues such as the implementation or expansion of a Reman program.

An example of this problem was the uncertainty among management whether Reman products could be imported/exported or not. Some thought it was allowed in some markets, while others disagreed. No decision on the Reman issue should be made without knowing the actual requirements for its carrying-out – see figure 5 for the necessary information in the decision making of the implementation or expansion of a Reman program.
6 CONCLUSIONS

This chapter combines all the analyzed findings of this study, and presents it in three sections: General Conclusions, General Findings and Theoretical Conclusions.

6.1 General Conclusions

Reman involves a customer exchanging a used product for a remanufactured (i.e. Reman) product. Many manufacturing firms, such as Volvo CE, provide this offer wherever possible and profitable. In markets restricted by trading difficulties with tariffs, regulations and logistical complications, manufacturing companies, such as Volvo CE, analyse when and where it would be suitable to implement a Reman production line, or a way of overcoming these difficulties through trade. The objective of this thesis has been to advise Volvo CE on this specific matter in regards to the Russian markets; this market is very important, in terms of future potential value.

In order to recapitulate the objective of this thesis, one must refer to the research question: In restricted markets, what variables are necessary to define why and how Reman can be a possible alternative to buying a new product or simply repairing an existing one, and when are alternatives a better option?

Markets are different, and it is difficult to design a generic model for the implementation or expansion of a Reman program, especially in regards to emerging restricted markets such as and Russia.

Nevertheless, this thesis has culminated to 3 decisive models in answering the research question. These are further explained in this chapter’s Theoretical Contributions section 6.3.2, but it must be concluded upon that figure 4 is the most important figure which truly answers the research question: it shows in a simple fashion which variables are important while deciding upon the implementation or expansion of a Reman program.

6.2 General Findings

Below are ten general findings, based on empirical research of databases and over 60 hours of unique interview sessions, followed by analysis.

1. Reman is not the ultimate option in every case - sometimes, other alternatives are better – this is an especially important point in reference to importing Reman instead of producing it locally, as well as the option to exchange used parts for new spare parts!
2. Reman is environmentally sustainable and hence part of Volvo CE’s core values. The company and customers need therefore to be educated with the company’s “environmental awareness” and the “general recycling concept” of Reman i.e. quality, rigid specifications, costs; and environmental effect.
3. Once Reman is set up on appropriate circumstances, costs and machine downtime could decrease, when one considers the decreased amount of energy and raw materials needed its production as well as the exchange lag time between a used product and a Reman one (i.e. it can be a very fast process with the appropriate planning).
4. Reman adds a competitive edge to manufacturing firms on after sales services as customers are given an overall cheaper product upgrade and wider product range at lower prices (for example, machine cores can be remanufactured up to 5 times, and a Reman engine costs around 60-70% of an equivalent new engine).
5. The perceived and actual value of a new machine is higher when the customer realises that he can sell his used core and components after a certain number of hours, instead of simply scrapping it. This also reduces the manufacturer’s scrapping costs, as they are legally responsible to dispose of their customers’ used products (in some regions i.e. EU).
6. Demand for Reman is significant and self sustainable, but today’s customers do not truly differentiate between Recon and Reman performances.
7. Communication and dedication to the Reman issue by all involved parties within Volvo International could help overcome a reasonable amount of trade restrictions, perhaps enabling the exchange of used products for Reman
products to Russia.

8. Much of the expected growth of the Reman program is based on improvement in Dealer stocking. Dealers are reluctant to stock because of the impact of significant negative cash flow due to unpredictable demand.

9. A Reman program is a strategic decision in manufacturing businesses; it will affect both sales of new machines and the after-sales product support. Some of suppliers to the main manufacturer might already be active in the remanufacturing market, and may be able to provide the main manufacturer with Reman components equivalent to the new components it already provides them with.

10. Remanufactured products allow firms to add another product to the after sales market with the potential to capture a higher percentage of the service in the profitable after-sales market of construction equipment.

6.3 Theoretical Conclusions

This chapter identifies this thesis’ different theoretical contributions to academic research. This chapter also justifies the validity of existing theories for the purpose of this thesis, and explains this thesis’ own theoretical findings.

6.3.1 Comparison of Empirical Findings to Existing Theories

The following five theories have all been considered and used in our research; through our data gathering process, we can verify these as supporting theories to this thesis:

1. About Remanufacturing: “The economical and environmental benefits of product remanufacturing have been widely recognized in the literature” (Savaskan et al, 2006, p. 1): Among other results, we found that remanufacturing is very profitable.

2. About Sustainability and Competitiveness: “for a non-market leader to hold any means of attacking a market leader, it must possess the 3 basic means to exist and resist” (Porter, 2004, pp. 11, 513-517). These are:
   i. Sustainable competitive advantage;
   ii. Proximity in other activities; and
   iii. Some impediment to leader retaliation.
   Furthermore, “Distinctive competencies are used to create a differentiated product […] which cannot be matched by the competition, and for which the customer is prepared to pay a superior price. Profit potential derives from a premium price” (Van Der Heijden, 2005, p. 71).

3. About Political and Economic Environment: “The environmental factors are external to the firm and [very important] uncontrollable variables in the foreign market” (Hollensen, 2004, p. 498)

4. About Natural Environment: “Recoverable product environment are becoming an increasingly important segment of the overall push in industry towards environmentally conscious manufacturing” (Jayaraman et al, 1999, p. 497).

5. About Market Entry: Markets are different, and to take Reman “out of the context [of one market] and compare it with a notionally similar phenomenon elsewhere [like Reman in another market …] you finish up with a comparison [without credibility and functionality]” (Söderman et al, 2006, p. 22-23).

6.3.2 Theoretical Contribution

The following three theories developed in this study are this study’s contribution to general business theory. These can be used for various decision making situations for various different business, especially in the scenario of market entrance or market expansion. Variables may vary according to the business utilizing the model, and its products and purposes.

1. About Figure 4, Variables Influencing the Decision Making Process on a Reman Program Implementation: this trapeze-shaped figure identifies relevant variables which should be considered when deciding upon whether to implement a Reman program, where, when and what type of a program. All these decisions can hopefully be assisted by identifying the relevant information to each of these variables, and relating these to one another.

2. About Figure 9, Decision Process on Introducing a Reman Program: this flow chart covers the basic questions identified by this research, when deciding to implement a Reman program. Depending on the different scenarios identified, this flow chart proposes a hypothetically accurate course of action for the business.
3. **About Figure 11, Second Model on Influencing Variables for Investment Decisions for Exchange Compatible Units:**

- This model is constructed based on the following assumptions: reference to a scenario in a highly restricted market; in restricted markets where the trade of used merchandise is possible though difficult; and it also assumes that regardless of machine population, its growth rate and other factors, a producer prefers to refer all Reman demands to nearest Reman centre instead of setting up a new Reman production plant.
- This model identifies different scenarios in which a business may find itself in terms of current market presence (i.e. market population) and market potential (i.e. market growth), and proposes appropriate courses of action accordingly (in this case, to implement Reman or not).
- This model considers that a significant population makes reference to a population of compatible parts. It is impossible to consider a population of machines significant enough for implementation of a Reman program without considering different engine families, generations, and models. The decision should be based on data concerning density of each components rather than the total number of machines in a market.

6.4 **Criticism of Result**

The most critical issue with this thesis refers to the respondents list: these have primarily been chosen by Volvo CE, and as such, this may have a biased influence on the final result and findings of this thesis, from which we retrieve managerial implications for manufacturers who wish to offer remanufactured products in Russia, as an example of restricted market.

Furthermore, the research is more or less impossible to replicate. This research carried out semi structured interviews, which have been interpreted by the two authors only, and this type of interviews will never result in the same answers (Yin, 2003, p. 34). Nevertheless, these interviews have all been recorded and (partly) printed. The managerial implications of this thesis, as well as large portions of the analysis and conclusions have been drawn towards Volvo’s activities, but not to the entire industry’s scope.

6.5 **Future Research**

This study aimed to establish recommendations for the implementation of Reman in restricted markets when possible, be that a local Reman production line, or a trading system with a standard set of procedures to ease the bureaucratic burden on machine downtime. As a consequence, this study fails to analyse possible courses of actions when the implementation of Reman is not possible. Perhaps this study also neglects the advantages and benefits of simpler alternatives such as a Recon alternative, a product which more often than not offers similar if not identical quality and performance as that of a Reman product. Much like Reman, an approved Recon product has to undergo a set of pre-defined standard procedures imposed by Volvo CE, in order to ensure continued and consistent quality and performance to the customer, and to decrease costs of (reconstruction or) production.

Furthermore, this study has always assumed that Reman demand should always be referred to the most suitable Reman centre when restrictions to trade are either inexistent or successfully overcome. It would be interesting, therefore, for a further study on the benefits of establishing new Volvo CE factories worldwide to better fulfil its customers’ needs worldwide, with decreased lead time between demand and delivery.

Volvo CE as any major manufacturing firm encounters great challenges in the successful establishment of a communication channel which would integrate and work as an interface for all of Volvo CE’s Communication Systems, thus helping accurate and efficient control and knowledge of each branch’s current needs and situations. The research into this issue should try to find out whether or not this solution is possible and whether it is beneficial to the business or not.
7 MANAGERIAL IMPLICATIONS

This section presents 7 points, outlining possible managerial implications, as a result of this research. These managerial implications have been drawn upon the assumption that Reman is among Volvo CE’s priorities.

1. **All of Volvo CE’s branches could profit from enhanced communication channels.**

This is possibly the most valuable recommendation this thesis can offer. We, the authors have found increasingly apparent problems in terms of communication of information between different branches and levels of Volvo CE worldwide. We, the authors, came across constantly contradicting information on crucial aspects of the business, such as legislation, rules of procedure and corporate culture. These misunderstandings could negatively influence strategic decisions for Volvo CE. The recommendation is therefore to further develop and enhance the quality of communication between all of Volvo CE’s corners, in Russia, Sweden and in all the other Volvo CE branches which we have not visited. “The Volvo Way” is a good source of guidelines to implement this recommendation.

2. **Volvo Vostok should establish a set of procedures to ensure the establishment of a smooth and effective Reman trading system with Volvo CE International.**

This research has concluded that Russian legislation does not forbid the national and international trade of used merchandise, but merely monitors it. Volvo Vostok should therefore immediately set out to design a set of standard operation procedures (SOPs) in the trading of Reman and used components/cores with Volvo CE in Eskilstuna, in order to fulfill its customers’ demand for Reman in Russia.

3. **After establishing SOPs for a Reman trading system, Volvo Vostok must educate its customers and staff on the benefits of Reman for both parties.**

Volvo Vostok staff and customers in Russia wrongfully disregard Reman as a low-quality alternative to a high-quality new product. Staff must be educated, because salesmen sell best when they believe in the product. In the same perspective, customers buy best when they are convinced of the products’ benefits.

4. **Volvo Vostok should monitor opportunities of establishing a production plant in Russia.**

Several persons within Volvo CE placed emphasis on this thesis to assume that the construction of new factories should be avoided. We the authors believe that Volvo CE can benefit from lower production costs and closer physical distance to dealers and customers. Volvo Vostok should therefore monitor the opportunities and advantages of building a new production line in Russia, with or without a Reman plant. It must be acknowledged that a production plant in Russia is not at all feasible for the time being.

5. **Reinan is a good offer, from the customer’s, manufacturer’s, society’s and government’s point of view.**

Reinan is a growing profitable business, with high profit margins, and the ability to enter a market which is mainly dominated by independent dealers with less sophisticated offers. Furthermore, customers benefit with Reman because of its lower prices with comparable performance to a new product. Reman help in the efficient allocation and reallocation of limited natural resources; Governments should support and promote this activity in all industries which can perform it.

6. **Alternatives can be a better offer than Reman in some circumstances.**

In the event of a market’s legislation prohibiting the import and export of Reman products, it may be profitable to offer a similar product to Reman yet without as many strict requirements, such as a Recon (reconstructed) product.

7. **Research and Development should be focused only in relevant geographical locations.**

Research and Development requires heavy investment and extremely qualified personnel who constantly communicate with each other effectively and openly. This recommendation inclines towards the focusing of Research and Development in a limited number of centres, distributed in existing premises with strategic business positioning.
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This section holds complementary ideas and information, as well as adjacent topics to the original research question. This study interviewed employees and guests at Volvo Vostok Moscow and Volvo CE Eskilstuna.

9.1 Interview in Eskilstuna 21st March 2006

How long have you been an employee with Volvo CE?

1. What are your past responsibilities?
2. What is your current position?
3. What do you, think of Russia as a Volvo CE market (generally speaking, not only Reman)?
4. What are the trade regulations/restrictions to “used” and “Reman” products in Russia?
5. Is there a production line in Russia today, how many, where, and how extensive is/are it/they?
6. What is the machine population in Russia? (known or estimated, in figures)
7. Do you think it is it sufficient for Reman?
8. Who are Volvo CE’s competitors in Russia?
9. Do these competitors offer Reman products?
10. If yes, to what scale?
11. If no, any prospects?
12. Is there any identified demand for Reman?
13. If yes, is it spontaneous demand or a result of Volvo CE’s local advertising of future Reman?
14. What are the logistical implications and how are they currently solved within Volvo CE’s activities?
15. What logistical implications would be completely new to Volvo CE upon the setting up of Reman?
16. Brief discussion on General Plan, Russian Part
17. Brief discussion on Sales Sheets

9.2 Interview in Moscow 27-29th April 2006

1. Your names, positions, and time working for Volvo
2. What does the sales team think of selling Reman instead of new products in the Russian market? Is the sale of Reman an internal threatening competitor or a branding complement?
3. How many machines/engines (based on products available in the Swedish Reman range) are operational in Russia, and their rough age estimate?
4. Sales and Profit and Loss figures for Volvo CE Russia?
5. Is there any spontaneous demand for Reman? Have customers come and asked about Reman because of individual research into the Reman programme in Sweden/USA/Brazil?
6. What legislative obstacles are there to importing Reman from Sweden/USA/Brazil?
7. What legislative obstacles are there to exporting Reman to other countries (Sweden, USA, and China for instance) if Reman were successfully introduced in Russia?
8. What are the logistical implications (i.e. transportation) of introducing a Reman programme in Russia? This is directly linked with the location of Volvo CE’s factories, dealers, resellers and customers in Russia; where are Volvo CE’s factories, dealers, resellers and customers located in Russia?
9. Forecasts for growth of machine population and Reman implementation?
10. In the Russian market, why and how is Reman a possible alternative to buying a new product or simply repairing an existing one?
11. When are the alternatives a better option?
12. Brief discussion on our models.