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A Feasibility Study on Refurbished Power-tools

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Metropolia

This journey started 2 years ago, filled with anticipation and excitement. It's exceeded my expectation, even with the bumps along the way and it's refuelled my passion for learning. The completion of this thesis project just put a broad smile on my face. It reminded me of the decision to embark on this journey, the person who encouraged me the most and the amazing friends and family I have now as a result of this programme. It is and was worth it.

My sincere appreciation to the exceptional faculty members specially to Dr James Collins for the guidance on writing this thesis and the outstanding classmates who have inspired me with their passion for meaningful work! My best wishes to my classmates (now my family) – the world needs your courage, compassion, and drive. It has been a rewarding and humbling experience to ask for help, learn from others, and try something outside of my comfort zone. I would like to take this chance to thank my colleagues and mentors in the case company for their time and cooperation.

Special THANKS to my super supportive family and friends who have always been my greatest source of encouragement – grateful to be surrounded by so much goodness.

My journey continues with my family, friends, and my community, with great optimism and even more hope.

Biniam Amare
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Abstract:

The thesis aims to conduct feasibility analysis and make recommendations for management of the case company. The case company offers only one premium quality power tools for all customer categories. Due to high price of the brand-new power tools, A class customers are the primary customer segment which have been addressed by the case company so far. The remaining prospective customers either do not have the capacity to invest in brand new power tools or no exposure to the premium quality power tools to make a purchase decision. Therefore, the main objective of this study is to conduct feasibility study of Refurbished Power tools for India subsidiary and make recommendations on refurbishment operation for management.

The thesis project started with developing a conceptual framework based on the existing body of knowledge from scientific publications and literatures. A Current State Analysis was conducted to assess the firm's current operations and market demand. The feasibility report was prepared based on the data collected in three stages from market research, interviews, and webinars.

A detailed feasibility report was presented to the key stakeholders based on the data collected. Additionally, cost estimation and selling price calculator developed during the study. The validation of the proposed power tool refurbishment process was done by key stakeholders and presented to the management team.

Keywords	Sustainability, Refurbish, Circular economy, Feasibility

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1 Introduction

In this thesis, a feasibility study for refurbished power tools is conducted for the case company's subsidiary in India.

Companies are moving towards approaching/satisfying customers demand by segmenting them in different groups. It is evident that all customers have different demand and purchasing capacity. The case company classified the customers in to three district groups called A, B and C-class customers based on the scale, buying potential and readiness to adopt and buy the new premium quality power tools.

One of the mega-trends in the current business environment is the move towards building sustainable businesses. The case company has taken an initiative to move towards becoming a sustainable and socially responsible company. This is clearly observed with the company's strategic move currently and in the coming future. The move towards becoming sustainable company is not focused only on the case company's operations but it also extends in overall business environment including final customers.

> *"We have a policy to source raw materials, components and services locally when we can, and great care is taken on auditing and approving all suppliers. We are only as sustainable as our whole network is together", says CEO.*

Refurbishment is a process in which the lifetime of a product can be extended. The level and extent of refurbishment highly depend on the geographical region and the industry standards. Refurbishment is becoming a common trend in a variety of industries specially in consumer electronics like phones and computers. In these industries, the level of refurbishment can go as good as a new product. In different literatures there are different definitions of refurbishment as a process.

For this thesis, the scope of refurbishment as process of maintaining and rebuilding pre-owned products (Bakker et al., 2014). In the context of the case company, during refurbishment process the parts of the used power tool which are close to failure will be repaired or replaced by new one. During the refurbishment process only critical components are changed to ensure the customer's expectations of refurbished power-tool performance are met.

1.1 Business Context

The case company is a world leader in surface finishing technology with groundbreaking sanding solutions. In addition, the company offer tailored and wide range of system solutions with superior innovative power tools. Sustainability is an integral part of the case company vision. The company serve a great variety of industries in automotive, wood and boat industry. The company's main customers include car body shops, automotive manufacturers, and wood product manufacturers. The company also serve construction, renovation, and composite industry.

The headquarter and production facilities of the case company are located mainly in Finland. More than 97% of products are exported and distributed to over 100 countries. The case company has 18 subsidiaries all over the world. The company's appearance is increasing in emerging markets like Asia and Africa.

1.2 Business Challenge, Objective and Outcome

The case company offers only one premium quality standard for all customer categories. Due to high price of the brand-new power tools, A class customers are the primary customer segment which have been addressed by the case company so far. The remaining prospective customers either do not have the capacity to invest in brand new power tools or no exposure to the premium quality power

tools to make a purchase decision. This has been an obstacle for reaching this untapped great segment of the market. The main driving factor to convenience this group of customers is to show the health benefit for their employees and efficiency increase in their day-to-day activities.

Daughter companies in emerging markets like India, show a great interest in refurbished power-tools as an alternative solution to reach class B and C customers, but there is no developed business case. The scope of this study is limited to Indian market as a pilot project. By using the learning from the pilot project, it can be scaled up and replicated to other markets as well. Therefore, **the main objective of this study is to conduct feasibility study of Refurbished Power tools for India subsidiary and make recommendations on refurbishment operation for management.**

The outcome of this study is a feasibility report and recommendations for management on Refurbished Power tools for India.

1.3 Thesis Outline

This study was conducted to undertake feasibility study and make recommendations for the decision makers about the next steps based on the feasibility report. Section one is the introduction part which introduces the study, business challenge based on context, objective, and outcome briefly. In section two, detail research approach, design and data collection stages and expected outcomes are described. Section three covers the tailored conceptual framework of feasibility analysis for this project based on the existing body of knowledge from literature. The tailored framework is used as a blueprint for conducting the feasibility analysis. Section four is where the current state of the case company analyzed based on the data collected from company's internal and publicly available documents, market research, personal and virtual interviews. Section five describes the outcome of the feasibility analysis. In section six initial recommendation on refurbish-

ment process is presented. Section seven briefly describes the validation of feasibility report and final recommendations to the management. In the final section, section eight, executive summary, conclusion, thesis evaluation and closing words are included.

1.4 Key Concepts

Natural resources are finite. The current way of using natural resources is reaching the limits. There is a need to rethink and redesign how we use natural resources. Sitra, Finnish Innovation Fund, defined Earth Overshoot Day as a calculated date on which humanity's ecological footprint exceeds the earth's annual biocapacity; that is, its capacity to produce renewable natural resources and process the greenhouse gas emissions caused by the use of fossil fuels. The 2020 earth overshoot date was August 22. The novel corona virus pandemic resulted in moving the date back as compared to the previous year. The figure below shows the overshoot days of 2020 by country. The overshoot date for Finland was April 5, 2020.

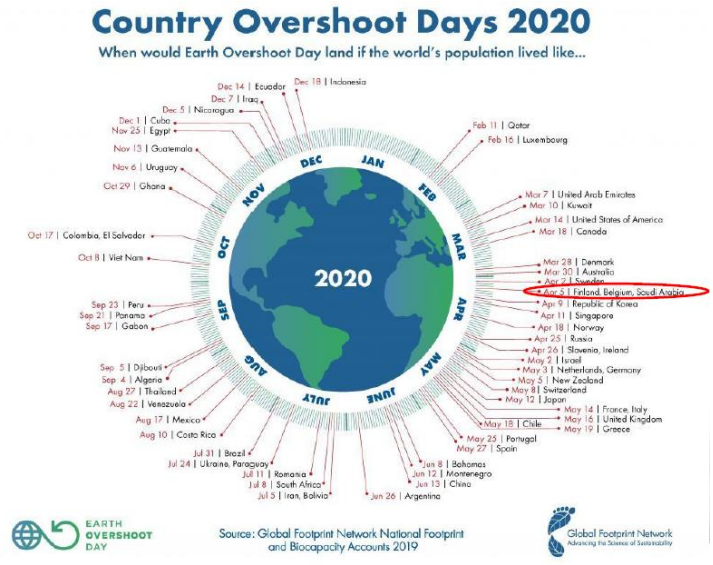

Figure 1. Country Overshoot Days 2020.

With the growing world population and change in the lifestyle, it is clearly seen that the current linear use of natural resources is not sustainable. In the linear model, natural resources are extracted, used, and end up as waste. There is an alternative way to this traditional way which is a circular economy concept. Circular economy is based on redesigning businesses to reduce waste and regenerating natural resources.

Circular economy can benefit businesses by creating new opportunities, reduced virgin-raw material costs, improved customer interaction and loyalty. Ellen Macarthur Foundation illustrate the circular economy model as a multistage process including repair, refurbishment, parts harvesting and finally recycling.

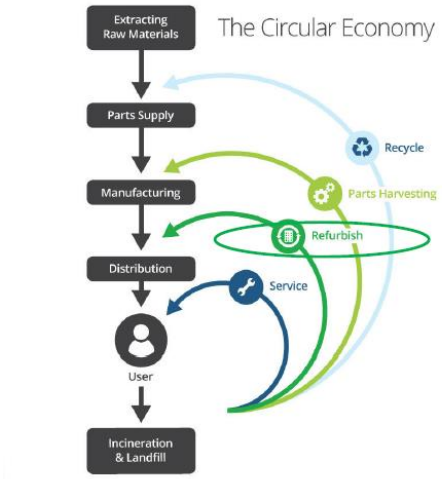

Figure 2. Circular Economy Model (Source: Ellen Macarthur Foundation)

Many businesses have service centers as part of after sales operations in which warranty and non-warranty products repaired and maintained. In Figure 2 above, Refurbishment is another integral part of the circular economy. Refurbishment is a process whereby pre-owned products are restored to the acceptable functionality level. The process can be either the whole product or part of it. The level and extent of refurbishment depend on industry and business case. Refurbishment help to increase the lifetime of products by repairing and changing spare parts and accessories.

2 Method and Material

The purpose of this section is to describe the three integral parts of the study namely research approach, data collection steps and data analysis during the thesis project.

2.1 Research Approach

There are different research approaches which are applied based on the nature and scope of the studies. The two main categories are fundamental and applied research. Fundamental research method mainly focuses on creation of principles based on existing body of knowledge. Whereas, applied research focus on problem solving methods to address an issue in a business case (Saunders et al., 2009).

Based on the objective and the expected outcome of this study mentioned in the previous section, action research approach is used. The main focus of action research is practical problem identification and solving process. This process usually contains multiple research stages (Schein,1999). Active research approach has two major advantages. On one hand, in action research approach, the involvement of the researcher is higher. On the other hand, this approach ensures higher engagement of stakeholders throughout the project in a collaborative way (Norton,2009). This active collaboration was crucial since the researcher of this study had limited previous exposure of the current operations of the case company.

The two research approaches namely, applied research and action research approaches have their own advantages. For this particular study, the combined applied action research method is chosen. Applied action research approach reduces the continuous repetition of research processes in order to fit the study into tight time frame (Kananen, 2013).

2.2 Research Design

The research design of this thesis is planned to reach the objective of the study in five district steps. Each step is designed with the expected outcome in order to systematically reach the general objective of the thesis.

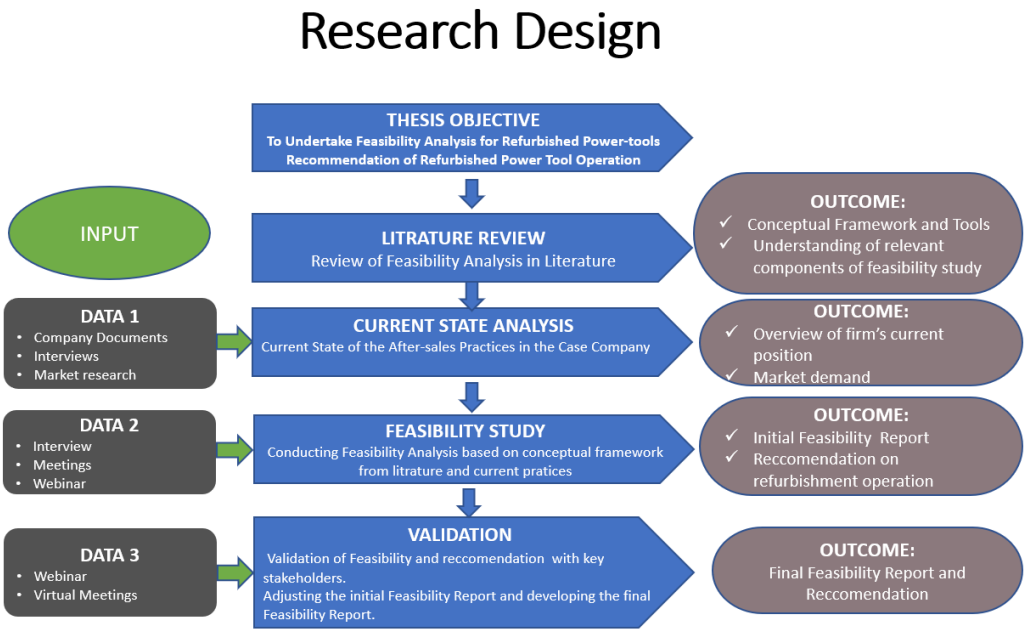

Figure 3 Research Design

As it is illustrated in Figure 3 above, the first step was setting the thesis objective. The overall objective of this study is to make a recommendation for the decision makers in the case company based on the feasibility study undertaken during the study. After determining the objective of the study, the next step was to develop conceptual framework based on the body of knowledge from relevant scientific journals and books.

The literature review was done first because there was no ongoing project at the case company related to the business case. In this step tailored feasibility analysis tool was developed. The third step was analyzing current state of the power tool business in the case company and identification of the demand for refurbished power-tools in the target market. The fourth step consisted of conducting feasibility study and analysis. In this forth step, the tools developed during the second step were used. The fifth and final step highlight of final recommendation for the management of the case company based on the feedback from key stakeholders during the validation webinar of the initial feasibility report and proposed business process of refurbished power tools operation developed in the previous sections.

2.3 Data Collection and Analysis

The data collection and analysis of this project conducted in multiple stages from a varieties of data sources by using different tools. As applied action research method is selected in this project, the main target of this kind of approach is to reach a desired objective by actively involving the researcher and key stakeholders throughout the study (Kananen, 2013).

The data collection and analysis of this study is based on the research design presented in the previous section. The data was collected in three stages with specific objective to achieve.

Data Plan

Data Round	Content	Data Source	Informant	Schedule	Outcome
DATA 1 **Current State Analysis**	• Overview of current practices • Determining market need for refurbished tools	• Company Documents • Interviews • Virtual interview • Market research	• After Sales Manager • Portfolio Manager • Marketing Manager • Class B and C customers	February-March 2020	✓ Firm's current position with regard to conceptual framework ✓ Market Demand
DATA 2 **Feasibility Analysis**	• Undertaking Feasibility Analysis for refurbished Power tools	• Workshop • Face-to-face interview • Virtual interview • Meetings	• After Sales Manager • Portfolio Manager, Power Tools • Portfolio Manager, Services • Marketing Manager	March 2020	✓ Initial Feasibility Report ✓ Reccomendation on refurbishment operation
DATA 3 **Validating Feasibility Report**	• Validation and evaluation of Feasibility Analysis	• Workshop • Meetings	• Data 1 & 2 participants • Head of portfolio management	June 2020	✓ Final Feasibility Report ✓ Reccomendation on refurbishment operation

Figure 4. Data collection plan

As shown in Figure 4 above, there were three data collection and analysis steps during the study. The first data collection step undertaken with two main objectives to understand the current status of the case company and to map the market need in the target market. To achieve these objectives, data was collected from different sources such as company documents, interviews and market research survey. The ideal way to map the market need was to undertake quantitative market research but due to time and financial constraints qualitative questionnaire was developed, and the Indian sales representative of the case company undertook the survey to the prospective B and C class customers. The sample questionnaire used in this data collection is attached as appendix 1 at the end. The pre-formulated questionnaire was developed by the researcher and lter modified by the Indian team to fit into the local standard. Conversational interviews were held at the prospective customer's body shops. This method of interview was chosen in order to get richer content. In addition, it helps to develop trust and give more chance for respondents to elaborate their viewpoints on the subject.

The company's internal and publicly published documents used in the starting analysis and later used in development of a tool to determine the business idea feasibility of the project are mentioned in the table 1 below.

	Name of the Document	Description	Number of Pages
1	Sustainability report	Digital copy of 2018 Sustainability report of case company	30
2	Spare part cost list	Self-cost prices of power tool spare parts	6
3	Price list PTS20	Price list of components	51
4	Aftersales process chart	India service center Operational chart	1
5	Aftersales process chart	Belgium service center Operational chart	3
6	Power tool repair time recommendations	Recommended and standard time for fault finding and repair	17
7	Power Tools Diagnostics version v3719	Power tool diagnosis user manual	33

Table 1. Company documents used in the starting analysis

The second set of data was collected during the feasibility analysis of the proposed business process with close collaboration with key stakeholders in Finland head office of the case company and the Indian subsidiary. The first interviews for the participants from Finland was undertaken face to face but due the COVID 19, the later stages of the interviews were undertaken virtually. As a result, the workshops were also shifted to webinars. Whereas all the communication with

the Indian team was through virtual meetings. The interviews and webinars were recorded with the permission of the participant for quality purpose and notes were taken.

	INFORMANT	DATA TYPE	TOPIC	TIME
DATA 1				
1	Portfolio Manager, Power tools	Meeting	Scope of the refurbished power tool business and strategy of the case company	February 20, 2020
2	Portfolio Manager, Services	Meeting	Current offering in case company	February 25, 2020
3	After Sales Manager	Meeting	Current after sales operation and cost structure	March 05, 2020
4	Marketing Manager	Virtual meeting	Technical and organizational capability in India	March 24, 2020
5	B & C class customers	Survey	Market need for refurbished power tool	February - March 2020
DATA 2				
6	Portfolio Manager, Power tools	Virtual meeting	Initial assessment of survey result	March 13, 2020
7	Marketing Manager	Virtual meeting	Organizational feasibility of current service center	March 18, 2020
8	Portfolio Manager, Services	Virtual meeting	Future services offerings in relation to refurbished power tools	March 13, 2020
9	Data 1 participants	Webinar	Initial feasibility report and development of business scenarios	March 24, 2020
DATA 3				
10	Marketing Manager	Virtual meeting	Demand forecast and technical capacity	June 17, 2020
11	Data 1 & 2 participants and Head of portfolio management	Webinar	Validation of initial feasibility report	June 18, 2020

Table 2. Data collection methods

In order to keep everyone involved during the project there was weekly status update meetings every Thursday morning.

Finally, with all valuable data collected in Data 1 and Data 2 the feasibility report and initial recommendations were developed. The third data collection was collected during the validation of the outcome of the feasibility analysis and recommendations. In this final step the feedback and detail practicalities were discussed during webinar by involving all key stakeholders during the project from Finland and India.

3 Literature Review / Existing Knowledge

This section consists of detail procedures of conducting feasibility study based on existing knowledge. In the first part, a general background information about conducting feasibility study is given. In the second section, different methods of development tools for feasibility study is discussed. A conceptual framework is developed in the third subsection based on the best practices discussed in sub-sections one and two which will be followed throughout this study. This conceptual framework is used to collect data 2, which was briefly discussed in data collection and analysis chapter previously. The data collected will be the baseline to analyze the current state of the case company's current operations in chapter 4.

3.1 Concept of Feasibility Study

Feasibility study is a term widely used in different disciplines. Even though the scope and the expected final outcome slightly differs; the general idea of feasibility studies is to determine whether an idea is fit for further full-scale application (Deborah et al. 2009). Feasibility studies undertaken in the initial stage of a business project. This helps to get firsthand information about the proposed business idea and to determine if the idea worth spending more resources for further development (Overton, 2007).

Feasibility study of a project involves multiple stages (Andrea et.al 2017). All steps in the analysis are inter-related to fit into the general objective and specific objectives of the study. Feasibility study is used to:

- Evaluate the general and specific objectives of the study
- Develop possible business scenarios
- Estimate and allocate available resources
- Recommend the next steps
- Make fact-based decision

3.2 Feasibility Study development tools

Feasibility study tools can be developed by combining different sections of feasibility analysis to meet the objective of the study. The tools are developed based on the scope and the study by employing either by primary or secondary research.

In primary research technique, the researcher collects and analyzes data specifically for the project. Customer surveys, questionnaires, focus group discussions, and prototype are some of the primary data collection methods. The most common method to collect data for primary research is to perform a buying intention survey to the potential customer segment (Rabianski, 2003).

Whereas in secondary research, data which has already been collected before for similar or other projects can be used as data source (Emma, 2008). In to using secondary research as a data source, it is necessary to carefully consider the data quality, relevance, accuracy and reliability (Rabianski, 2003). Some researchers consider re-analysis of own primary data as a secondary data source as well (Schutt, 2006).

3.3 Conceptual Framework

The conceptual framework for this study is tailormade and designed to touch the main sections of feasibility study discussed in the literature review section. The conceptual framework is developed based on the combination of the existing body of knowledge in literature.

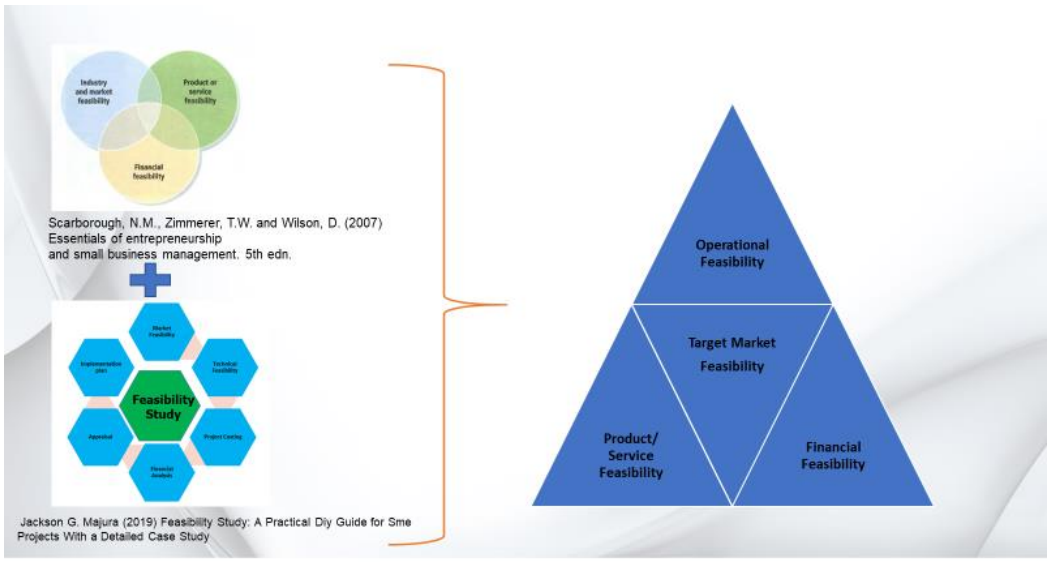

Figure 5. Modified Feasibility Analysis Framework

Based on the findings from different literatures, the modified feasibility analysis framework is developed. The framework consists of four major sections:

1) Product/ Service feasibility
2) Target market feasibility
3) Operational feasibility
4) Financial feasibility.

These four parts are described briefly in the following sections.

3.3.1 Product/Service Feasibility

Product or service feasibility analysis describes the extent to which the product or service of the proposed business idea appeal to the prospective customers. (Norman, 2011). There are two major components of this feasibility part:

1. Determination of future customer demand
2. Identifying the desirability of the product

The first component is determination of future customer demand. Customer demand prediction is vital component of a feasibility study. As the customer satisfaction highly dependent on the expectation of the product, understanding customers' expectation and perception is very important (Cao et al. 2016). Understanding customers' expectation and perception about the brand helps to meet the future demand. Customer expectation is directly related to the brand image in the customer eye

After determining the customer demand, the second component is identifying the desirability of the product to meet the expectation of the prospective customers. Priorities in product desirability properties are based on future customer in order to meet customer satisfaction (Marcelo et al. 2020)

3.3.2 Target Market Feasibility

Evaluation of proposed business idea include the industry feasibility followed by target market feasibility. If the firm is new entrant to the industry, it is ideal to perform basic analysis of the industry. Overall evaluation of industry attractiveness is performed either as pre-feasibility or part of the feasibility study depending on the previous exposure to the industry. Industry attractiveness assessment give a broad picture at macro level (Norman, 2011). The following points are addressed during industry feasibility analysis:

- Scope and maturity of the industry
- Trends in the industry
- Opportunities of the industry
- threats the industry facing
- Profitability of the industry
- Intensity of competition

The general purpose of target market feasibility is to assess the attractiveness of the proposed business idea for the potential market. Identification of the target market start with market segmentation. Market segmentation is a method in which the potential market is segmented into different groups. The market segmentation criteria depend on the need, characteristics and behaviour of customers. (Kotler et al.2010).

3.3.3 Operational Feasibility

Operational feasibility is used to analyze organizational competence to perform the future operations towards the proposed business idea. According to Corbitt, G. and Norman, R. (1991), operational feasibility is also used to identify the gap to satisfy future customer demand. In organizational feasibility, all non-financial resources will be identified. The financial resources are described in the next sub section.

In addition, technical capability of the firm is assessed in this part of feasibility study. Technical feasibility mainly focusses on two points; resource and technology availability (Jackson, 2019).

In this thesis project, Operational feasibility addresses the following points:

- Identification extra capacity in the current service centers
- Availability of technical expertise
- Non-financial resources to satisfy future customer demand
- Legal and environmental restrictions
- Local technician skill levels
- Availability of used power-tools for refurbishment
- Potential project constraints
- Current and future organizational capacity

3.3.4 Financial Feasibility

The fourth and final part of the modified conceptual framework for this thesis is financial feasibility. The scope of this study is to make a broad financial analysis to identify if the proposed business idea has a positive cash flow.

Financial feasibility is used identify the financial requirements to set up and operate the business idea under the study. Scarborough (2011) stated three main sections of financial feasibility:

- Initial capital investments
- Estimated earnings
- Return on Investment

3.3.5 Decision support system

After doing the four individual parts of feasibility study described in the previous section, the following decision-making tree is used to recommend for the management about the next steps.

Figure 6. Decision making tree

As described in figure 6 above, after undertaking the four major feasibility analysis parts, if the outcome is positive for all parts which shows that the business idea is feasible to go forward and start developing a business plan. Whereas if one or more of the four parts of the feasibility study not met, the next step will be to rethink the overall business idea or drop it. Next section describes the current state analysis of the case company.

4 Current State Analysis

This section of the study discussed the current state of the case company's operations. A summary of the current aftersales activities covered in the first sub section followed by sustainability activities, current after sales processes and ongoing pilot projects in the case company.

4.1 Overview of the Current State Analysis Stage

The current state analysis for this study was conducted to get an understanding of the current after sales activities of the case company in order to get a brief understanding of the current operations and ongoing projects which are related to this study. This stage of the study was started with reviewing the company documents and undertaking informative interviews with key stakeholders.

The case company has aftersales centers in selected countries in different geographical locations. Even though this feasibility study is conducted for Indian market, in addition the current aftersales operation of Belgium service center is also included to benchmark and learn from the service center with better digital maturity and high efficiency.

The main objective of this section of the study is to give a general overview of the case company's initiative to become sustainable company and lead the industry by innovative ideas and business models in general, more specifically aftersales operations in company's own service centers.

4.2 Sustainability

Sustainability is the core of the case company's strategy. Long term sustainable growth is a strategic choice of the firm than short term gains by cutting the corners. The company's vision statement shows its commitment for sustainability as *"To be seen by customers and interested parties as the most responsible company".* The company strives to operate all business operations and manufacturing with reduced environmental impact and ensure the health and safety of the workers and end users as well.

> *"The objective of our business strategy is long-term, profitable growth, allowing us to ensure sustainable development. We aim to continually enhance our environmental responsibility by shifting to more environmentally friendly forms of energy and raw materials."*
>
> CEO, Case Company

To achieve long lasting profitable business sustainable development of the company's operations is an integral part. The company uses the Triple Bottomline framework of sustainability. The triple bottom line has three integral parts namely People, Planet and Profit. The case company's activities in these three parts are explained briefly in the following paragraphs.

Figure 7. Triple Bottom Line 3P Formulation

In its long history, the case company's success is based on the high-performance of its innovative employees. All employees at all stages of the organizational structure are encouraged to develop and grow their responsibility areas. The company also offers wide range of inhouse training to upskill and upgrade the expertise in their respected area of expertise. HR department actively working towards ensuring the wellbeing of the employees in both production and office areas. These initiatives highly increase the satisfaction of the employees. In addition to its direct employees, the company also take into consideration the safety of the end users of the power-tools by innovative ergonomically suitable power tools. One of the reasons to undertake this study is to give B and C class customers a chance to use safe power-tool in their daily work life. The company also launched mobile application with which the power tool user can monitor the vibration level, temperature status and overall safety at while using the power-tools. In addition to user safety, these digital innovations increase the life cycle of the power tool.

Reducing the environmental impact during manufacturing and usage is the integral focus during product development and innovation. Reducing environmental footprint in end-to-end supply chain with full compliance to EU regulations is the main target. This is achieved by the following developments:

- Innovating new technologies
- Improving waste reduction and management systems
- Reducing heavy metal use in the products
- Reducing energy consumption in manufacturing
- Use renewable energy sources
- Enhancing the thermal efficiency of the power-tools

Customers are becoming more environmentally conscious and demanding innovative ways in extending the life of tools, reducing use of natural resources, recycling and part harvesting once the tool is no more functional. Refurbishing the

power-tools increase the lifetime of the tools and reduce the environmental footprint.

Stable long-term profitability is a key for the success of any business in the current competitive international environment. This long-term objective is incorporated in every stage of the company's operations and strategy. The case company is part of a family-owned group with solid financial foundation and strong financial results in the past years. Good financial performance is the base for achieving social and environmental goals.

4.3 After Sales Operations

This study is conducted focusing on the case company's India subsidiary. In addition to the after sales operations in India, the operations in Belgium is also studied to benchmark and take the best practices.

4.3.1 India Service Center

There is only one service center in India which serve all customers from all parts of the country. The company is planning to open second service center in a different geographical location in order to efficiently serve the customers. Most of the customer service in India is undertaken manually with the assigned personnel. A process of the after sales service at the center is shown in the figure below and followed by a brief explanation of each step.

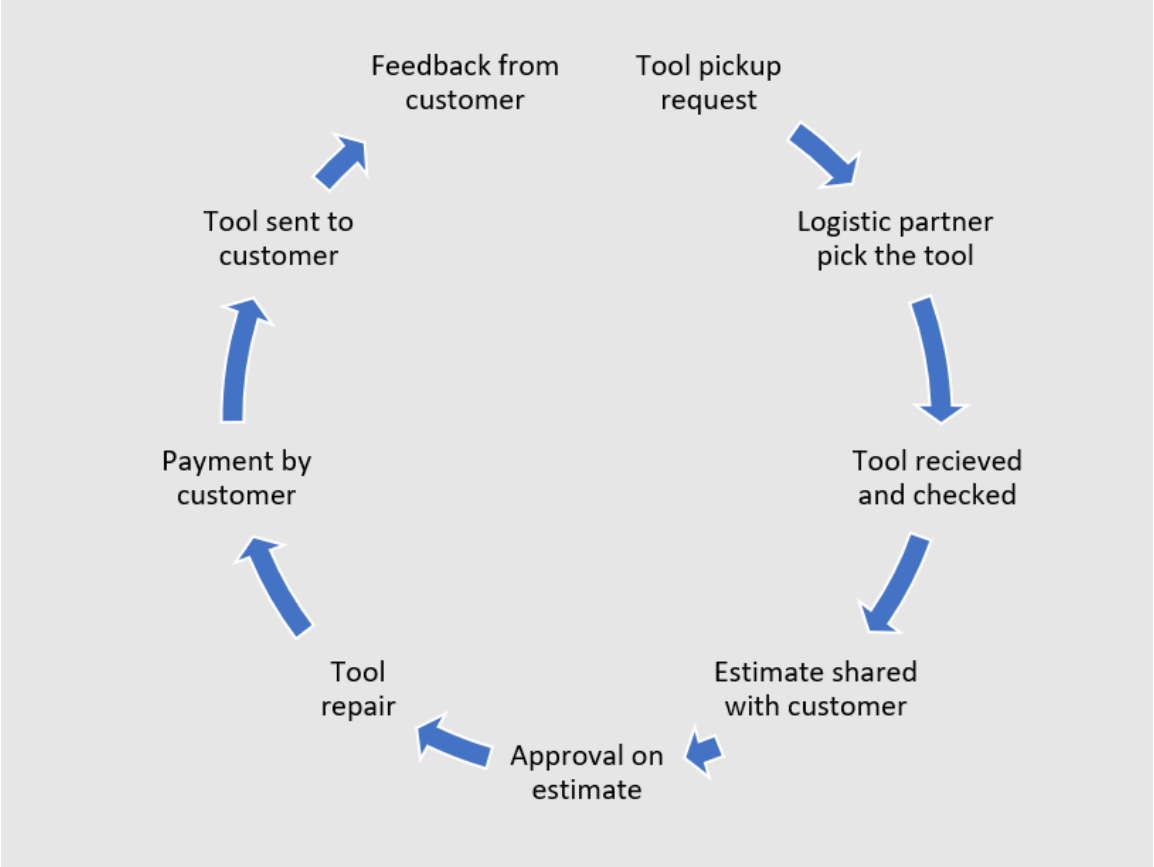

Figure 8. After sales operation in India Service Center

i. Tool pick up request

Customers with faulty tools call to the service center and give a brief explanation about the broken tools and the necessary information. The name of the customer, serial ID of the tool, the location of the customer, explanation of the fault, whether the tool ha a valid warranty or not is documented during the call and forwarded to the service technician. The possible tool pickup date and time agreed.

ii. Logistics partner pick the tools

The logistics partner collects the tools as agreed by the customer and customer care unit at the service center.

iii. Tools received and checked at Service Center

When the tools arrive at the service enter, the broken tool and the information collected by the customer service forwarded to the service technician. The technician check if the information provided match with the tool received. After undertaking troubleshooting and fault finding, if the tool still has valid warranty it directly goes for repair.

iv. Estimate shared with customer

If the tool received is not covered by warranty, the service technician estimates the repair price and forward it to the customer.

v. Approval on estimate

The customer approves the repair price estimation.

vi. Tools repaired

Broken tools with a valid warranty repaired immediately. Non warranty tools repaired upon the approval of the cost estimate by the customer.

vii. Payment by customer

The customer with non-warranty tool make the necessary payment.

viii. Tool sent to customer

Upon receipt of the payment, the service center sends back the repaired tool to the customer by logistics partner on agreed date and time.

ix. Feedback call

Customer service make a follow up call in order to get the feedback. If there is a concern from the customer side, the case will be forwarded to the service technician for further explanation.

4.3.2 Belgium Service Center

Belgium service center has more automated in the customer service as compared to India service center which is briefly explained in the previous sub section. The service center in Belgium has advanced digital setup and maturity which is integrated to the company' own Enterprise Resource Planning (ERP) system.

Figure 9 below shows the flow chart of the Belgium service center. The different steps in the process of service center operation are explained in the following sub sections.

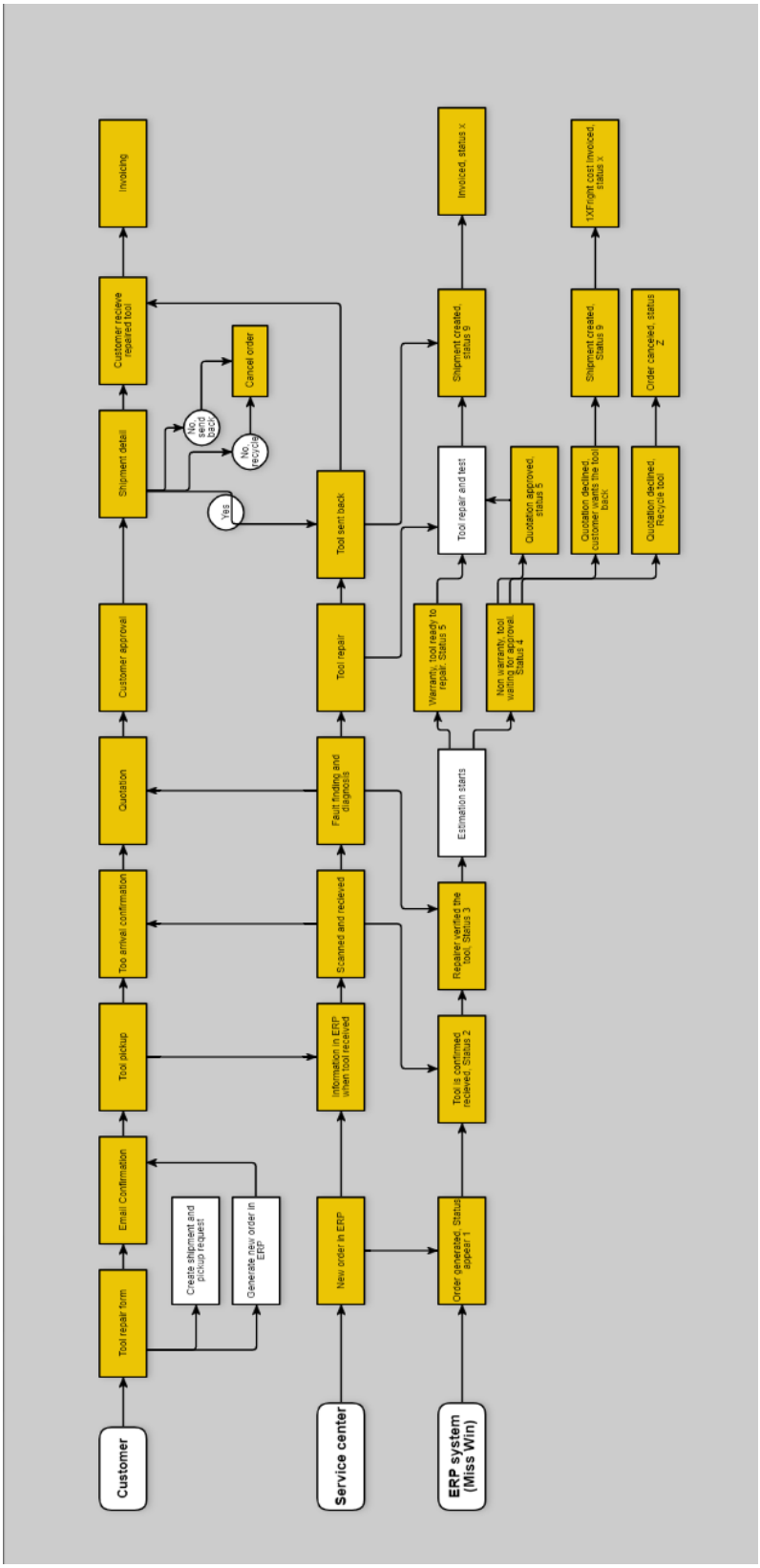

Figure 9. After sales operation in Belgium Service Center.

i. Tool repair form

Customer with faulty power tool fill a tool repair form online. In the form the customer fills the following information: type of the tool, date of purchase, unique ID number, and brief explanation of the fault.

Once the customer sends the filled form, the system automatically creates shipment and pick up request. At the same time the company's ERP system generate a new repair order.

ii. Confirmation and shipping documents

Customer receives automated confirmation email with detail shipping documents and labels.

iii. Tool shipment

Customer takes the tool to the drop off location or logistics partner pick from the agreed location. Once the tool is picked, the system changes the status of the order created in the first step to incoming tool and notify the service center.

iv. Receiving the tool

The service center scans the label and confirm as received when the tool is delivered by the logistics partner. The customer will get automated notification that the tool has arrived at the service center. The service technician also receives a message about the arrival of the tool.

v. Fault finding and estimation

Technician verifies tool model and does an estimation of spare parts that needs to be replaced. In warranty cases the service starts directly. In non-

warranty cases a quotation is sent out to the customer, but if repair costs are below the maximum repair limit, service starts directly.

vi. Repair

If the customer accepts the repair quotation, tool is repaired according to quotation. Replaced parts that haven't been included in the quotation will not be invoiced. The tool will be repaired and tested in the service center for quality assurance.

If the customer declines the quotation and want tool back, shipment will be created and invoiced for the return fright cost. If the customer does not want the un-repaired tool back, it will be sent for recycling and the order will be cancelled.

vii. Return of repaired tool

Shipment is created for repaired tool. Customer receives an e-mail mail with shipment and tracking details together with repair report.

viii. Invoice

Customer receives invoice.

4.4 Ongoing pilot projects

There are some ongoing projects in the case company to try out new offering to diversify the products and services. The main aim of these ongoing pilot projects is to test and validate new business models to reach the different customer groups which are not currently reached with the present business model. Among the pilot projects running during this study two projects are selected to be part of

this feasibility study in order to achieve the desired objective. The two pilot projects are briefly explained in the following paragraphs.

The company continuously investigating new business ideas and model in services portfolio to continue leading the industry. In this pilot project different business model ideas are tested. The company currently only selling new premium power tools to A-class customers only. The general idea of this service business model is to enable the prospective customers to experience the premium standard of the tools without buying the new power tool. In this model the existing customers can use the offering in the peak season instead of buying additional tools. The prospective customers also get a chance to try the tools. This enhances the decision of the prospective customers to buy the new tools and create current customers' loyalty of to the brand. One of the projects is named as "Pay Per Use". The customer gets a chance to rent a specific tool and a tool kit with different combination of tools depending on the project for specified period of time.

The second ongoing pilot project is focusing on the maintenance and repair of the tools owned by the customer. With the current after sales model, the tools with fault are sent to the central service center for service. This pilot project is called "Service-At- Door-Step". The general idea of this business scenario is that the service technician will visit the existing customer to maintain and repair their tools. Unlike the current model in which the tools which come to the service center are already broken while in this pilot project the company exploring possibilities of predictive and preventive maintenance also before the tool stop working.

5 Feasibility Analysis

Data collected from different sources to conduct feasibility analysis. The data collection was performed based on the conceptual framework derived from best practices in literature and scientific articles. Depending on the type of data needed for the four parts of feasibility analysis, different data sources and collection methods were used. In the following subsections the outcome and insights of data collection steps is briefly analyzed. The data collection started by interviewing the stakeholders in Finland face to face and virtually in India. Alongside the interviews, customer survey was conducted by the sales team in India. After getting an insight from customer survey and interviews a detail financial analysis was conducted.

5.1.1 Product/ Service Feasibility Analysis

Product / service feasibility was performed to assess the desirability of the refurbished power tool for the target customer segment. Data was collected by interviewing prospective B and C class customers. In this section of the study the current operation of the body shops, brand exposure and awareness of the case company. Prospective customers' intention of buying and using refurbished power tools is analyzed.

Based on the market research 62% of the respondents have never used any kind of power tool in their body shop. While the remaining 38% have used a power tool from the case company or another brand currently or in the past. Only 8% of the respondents have used the power tool manufactured by the case company. The customers who are not using the power tools are either using pneumatic sanders or hand sanding. They usually use rubber block or wooden piece for wet sanding which is time consuming and with low quality of finished surface.

There is direct correlation between the customers intention for owning power tool and their previous experience of using the power-tool from the case company or other brands. All respondents who have previously used the power-tool prefer to

buy brand new tool than the refurbished. The reason they gave was that using the new tool will enhance the quality of their work. At the same time, it is safe for their workers and increase the efficiency of their overall operation.

The survey result indicated there is high intention of buying for refurbished power-tools. B and C class customers are very price sensitive segments of the market. The respondents were asked about their expectations from the refurbished power tool. They expect to:

- Reduce the manpower cost
- Enhance their productivity
- Create better working environment

Based on the data collected, many factors affect the buying decision of refurbished power-tool. The following are the main factors in order of priority:

1. Low cost
2. High performance
3. Warranty cover
4. Appearance of the tool
5. Less vibration levels
6. Aftersales services

5.1.2 Target Market Feasibility Analysis

B and C class customers are the target market segments of this study. Randomly selected prospective customers were interviewed by the sales team from India subsidiary. In this second section of the feasibility study the overall maturity level of the industry and the appeal of refurbished power tool for the target market is analyzed.

The target industry is characterized by high profit margin for premium power-tools. One key factor in the industry to convince the customers to use specific tool is the brand image in the eyes of the target market.

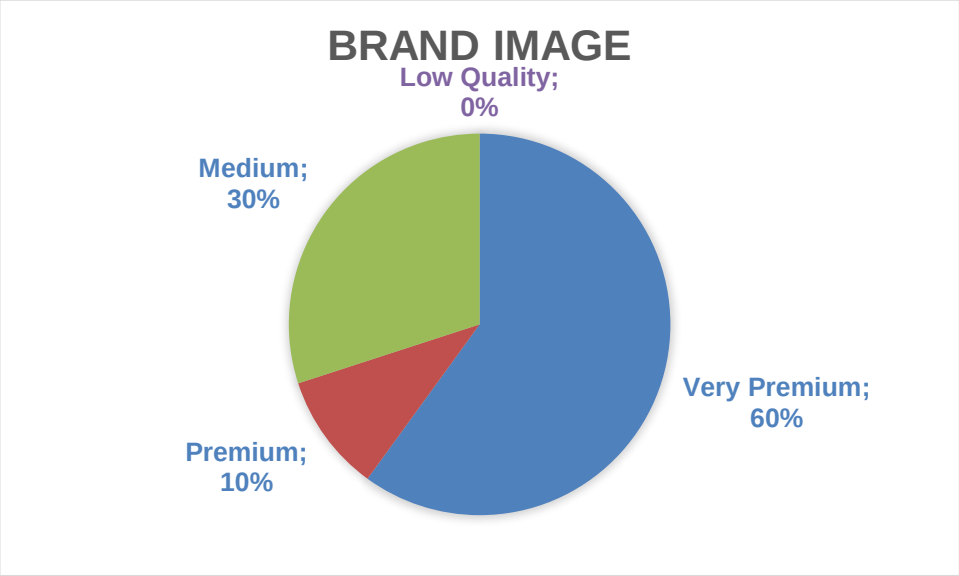

Figure 10. Brand image

Figure 10 above shows the case company's brand is well positioned as high-quality tool in the target market. The respondents have different perspective towards the brand. 60% of the respondents recognize the company brand as a very premium brand in the industry. While 30% see the brand as medium quality and the remaining 10% voted for premium quality. None of the respondents considered the brand al low quality.

The majority, 92%, of the respondents show an interest to buy either new (30%) or refurbished (62%) power-tool. The ones which inclined to buy the refurbished

power-tool have limited or no prior exposure of using similar tools in their body shop in the past.

In general, the target market is promising, and the customers are excited about the refurbished power tool offering. It is clearly seen that there is a great demand for refurbished power-tool among B and C class customers.

5.1.3 Operational Feasibility Analysis

In this third section of feasibility study the technical and organizational capability of the case company and third-party repairer examined. The main objective of this section is to determine whether the company has sufficient technical expertise, organizational competence, and non-financial resources to successfully launch a Refurbishment business.

The case company own one central service center in India. The current service center has a capacity to repair 150 tools per month but when this study was conducted the service center repair an average of 100 tools per month. The service center has an extra capacity at the moment to start a refurbishment pilot project. There is a possibility to integrate refurbishment of power tools to the current after sales operation.

The existing service center has enough technical expertise to handle refurbishment of power tools. Refurbishment of power-tools can be undertaken alongside the current aftersales repair and maintenance of the tools. The service center has a possibility to allocate addition resources if needed.

The organizational setup for customer service and technical sales was evaluated together with Indian team. The center has a working structure for the current aftersales operation. There is a need to integrate the integrate the refurbishment business processes to the existing one with additional resources.

The case company is also planning to start second service center in another part of the country. This will increase customer engagement and reduce the service time with efficient logistics structure. When the new service center start operation, the overall capacity of the service centers is expected to be higher than the current level. Both service centers will have extra capacity for some time. Adding refurbishment to the current service centers activities will enhance the efficiency level of the centers.

In the second business scenario, if the case company decide to work with selected third-party repairer for refurbishment, the repairer with proper organizational setup and technical expertise will be carefully selected. If there is a need, the central service center can arrange training and knowledge sharing.

5.1.4 Financial Feasibility Analysis

Financial feasibility of the study was performed based on the input from the previous three feasibility sections. The target selling price and level of refurbishment are based on the market research conducted in order to guarantee the satisfaction level of the customers and make a profitable business case.

In the following subsections the detail of the two business scenarios and the financial calculations will be discussed.

5.1.4.1 Refurbishment at the central service center

The central service center in India has extra capacity to start the refurbished power-tool business as indicated in the technical and organizational feasibility study in the previous section. There is no need for big initial investment to handle the pilot project at the case company´s central service center.

The scope of this study includes the financial calculations for refurbishing the tool at the service center, administrative costs and logistics cost. The cost calculation for technical sales is not included in the financial calculations of this study but

taken into consideration in the later parts of the study while validating the recommendation making the conclusion.

A financial calculator tools is developed with detail cost components. The detail of the program will be discussed in the next chapter. The selling price of the refurbished power tool is determined by the buying potential of the B and C class customers which was based on the data collected during market research.

5.1.4.2 Third party refurbishment

The second business case scenario for refurbished power tool business case is working with selected third-party partners. These partners will be carefully selected with technical and organizational capability. The partners will be accredited to perform refurbishment by the case company's central service center in India. The selected partner will invest the initial capital and fulfill all the requirements to be set by the case company.

Particulars	Units	Per Unit Cost	Total Cost
Manpower Cost	2		
Equipment Cost Euros with life of 5 years	1		
Office & Repair Space	12		
Variable Cost (Electricity, Travel etc)	12		
Marketing Cost	12		
Total Investment			
Revenue Generation			
Tools Sales @ **85** Tools in month			
Service Repairing of Sold Tools			
Total Revenue Generated			
Profit Margin			
Net Profit			
ROI %			41 %

Particulars	Units	Per Unit C	Total Cost
Manpower Cost	2		
Equipment Cost Euros with life of 5 years	1		
Office & Repair Space	12		
Variable Cost (Electricity, Travel etc)	12		
Marketing Cost	12		
Total Investment			
Revenue Generation			
Tools Sales @ **100** Tools in month			
Service Repairing of Sold Tools			
Total Revenue Generated			
Profit Margin			
Net Profit			
ROI %			65 %

Figure 11. Return on Investment (ROI) calculations.

Return on Investment for the partner highly depend on the number refurbished power-tool per month. Figure 11 above shows the calculated ROI for different numbers of refurbished tools. The more tools the partner refurbish, the higher ROI will be. If the company refurbish 85 tools per month, the ROI will be 41%. The ROI for 120 tools refurbishment per month increases to 65%.

6 Recommendation on Refurbished Power-tools Operations for the Case Company

There is no developed business case when this study conducted for refurbished power-tools. The foundation of the recommended operations is based on the data collected and analyzed in the first and second stages of the project. The data used for developing and proposing the refurbished power tool operations was based on meetings, face to face interviews, virtual interviews and webinar.

There are two possible business case scenarios for refurbished power-tool business. In this chapter the two option will be discussed. Both scenarios are developed by involving stakeholders from Finland and India. Refurbishment can be performed by third party partner or central service center of the company.

6.1 Partner Refurbishment model

This first option is proposed by the India subsidiary for trial. In the first scenario third party partner will be selected. The selected partner will handle all the refurbishment operations and sales of the refurbished tools.

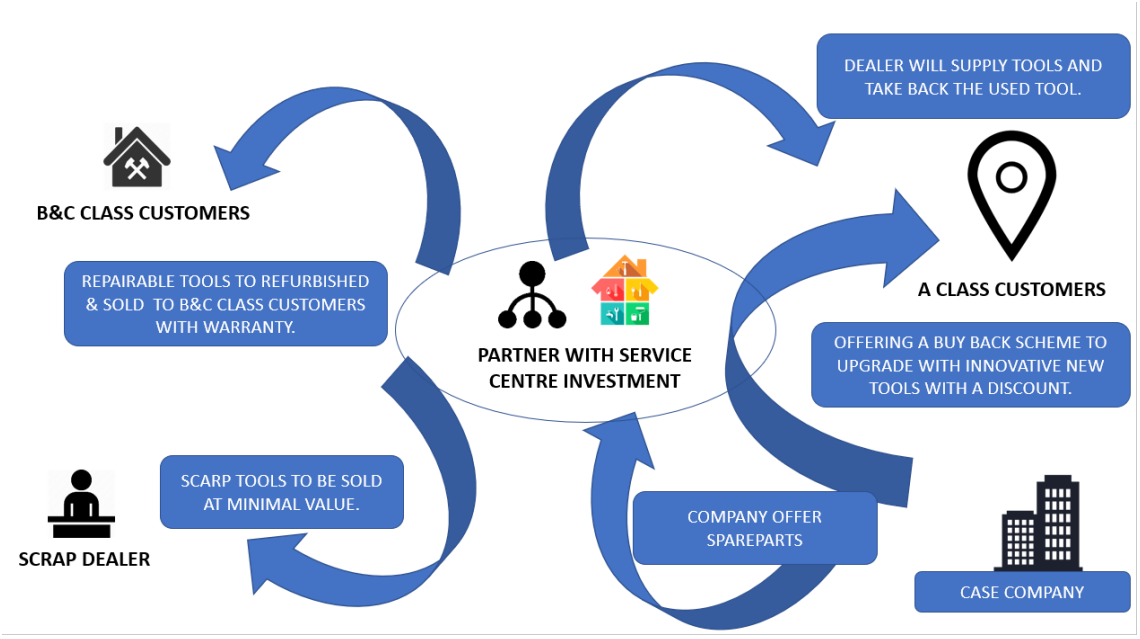

Figure 12. Partner refurbishment model.

The figure above shows a detail process flow of refurbishment by a pre-selected partner with initial investment and operational capabilities. In this model there are three major steps:

- Collecting used tools
- Refurbishing
- Selling

Used power-tool for refurbishment are sourced only from A-class customers. The technical sales of the case company and the partner cooperate in this first stage. The technical sales team of the company communicate with the existing A-class customers. The team offer a buy back scheme with a discount on the next purchase of the new innovative tool to the customer who is already using the power-tool. When agreement is made, the partner send the new tool to the customer and collect the used tool for refurbishment. The monetary value of the collected tool determined by the condition of the used tool.

Once the used tool arrives to the partner service center, trained technician assesses and estimate the cost of refurbishment. If the cost of refurbishment is minimal and the partner get a profit, the refurbishment continues. Otherwise the tool will be sent to recycling.

The partner is fully responsible to sell the refurbished tool to B- and C-class customers. The warranty issue and after sales services are all the responsibility of the partner. In this business model, the partner is the one with direct contact with the target customers. There is a limitation to get direct customer feedback and gather information for future development of refurbished power-tool business by the case company.

6.2 Overview of Refurbished Power-tools Operations at Central Service Center

Given the fact that this study is conducted to get an insight to run a pilot project in India, direct contact between the central service center and the prospective customers is crucial for the success of this and future projects. Direct feedback from B and C-class customers will help to develop the business case and transfer the knowledge and experience to other markets. The data and facts collected during refurbishment and feedback received after sales from customers are valuable assets for future projects.

Handling all the processes of refurbishment operation at the central service center enables the company to control the overall process and ensure every refurbished power tool is fit and safe for the future customer. By this way the company guarantee the expectations of the customers are met.

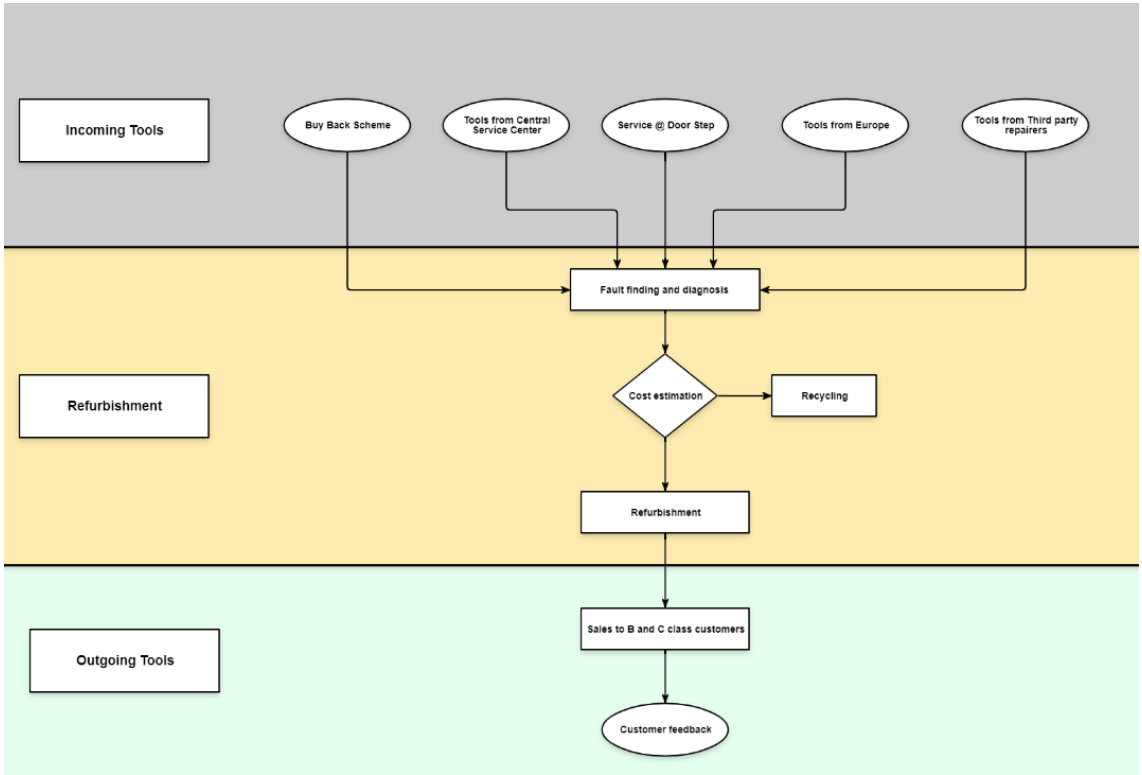

Figure 13. Recommended refurbishment operation at India central service center.

The refurbishment process contains similar stages in both scenarios. The difference is on detail procedure in each stage. The three major stages of the process are explained in the next sub sections. Even though the stages have similarities but differs in detail for each scenario.

6.2.1 Incoming Power-tools

The first stage of refurbishment process is getting used power-tools from different sources. This stage is a critical stage in which selection and collection of the tools which are fit for refurbishment. In order to diversify the sources of the used tools different options were considered during the study. The main target of diversifying the used tools sources is to guarantee the tools which come to the central service center are in good condition with minimum refurbishment cost. The status of incoming tool determines the level of refurbishment which is directly related to the total refurbishment cost and selling price to the target customers.

Four different sources of incoming tools were identified during the project.

1. **Buy Back Scheme:** Sales team contact with the existing A-class customer who own a power-tool and give an attractive offer for upgrading their tools to an innovative new version with better quality. Part of the deal will be that when the customer gets a new tool, the used tool will be sent to the service center for diagnosis and refurbishment if it is in acceptable condition.

2. **Central Service Center:** Faulty tools which come to the service center will be examined by service technician. The service technician will use a tool developed during the study to estimate the cost of refurbishment for the power tool which come for repair. Currently the service center gives a cost estimation for repair to the owner of the faulty tools. Together with technical sales team, the technician gives an option to the customer that they can get a new tool and their old tool will be refurbished.

3. **Service At Door Step:** This is a pilot project ongoing during the study as part of service portfolio business. In this model the service technician equipped with diagnostic tools and maintenance equipment repair the used tools at the customer's premise. The technician can use the same tool developed and used by service center to estimate the cost of refurbishment for the tool. If the refurbishment cost is within the range, the sales team contact the existing customer with an offer for new tool and collect the used tool for refurbishment.

4. **Tools from Europe:** During the study number of power-tools in Europe is high. There is a possibility to collect the used tools from Europe and send to India central service center for refurbishment. Even though this is a big potential to increase the number of tools for refurbishment different rules and regulations need to be investigated.

5. **Tools from Third Party Service Centers:** Central service center can work with pre-selected independent service centers located at different parts of the country to get faulty tools which fulfill the requirements for refurbishment with minimum cost.

6.2.2 Refurbishment of Power-tools

Refurbishment process proceeds once the used tools are collected and arrived at central service centers from different channels described on the previous sub section. Refurbishment at service center start with fault finding. The service technician diagnoses the power tools using diagnostic program. Power Tools Diagnostic Software is used to gather stored information from the tools, intelligent batteries and speed controller. The power tool can be connected to the diagnostic program either by cable or Bluetooth depending on the capability of the model and version of the tool. This is a major step in determining whether the used tool is suitable for refurbishment or not.

Once the fault finding and diagnosis is performed, the service technician feed the information to cost estimation program developed during this study. The cost estimation includes the price of spare parts, the refurbishment time and administrative costs. The detail of the cost estimation program will be explained in detail in the next subchapter.

After fault finding, diagnosis and cost estimation, the service center will have enough information to decide either to continue refurbishment or to recycle the tool.

6.3 Outgoing Power-tools

The refurbished power tools will be sold to the B and C class customers at an affordable price. Based on the local knowledge from Indian market, collecting used tools from big cities and selling the refurbished ones to small cities is more feasible. At the time of the study the case company has only one central service center in India, the service center will work with carefully selected partners who can handle the sales of the refurbished power tools to the prospective customers in the rural parts of India.

In addition to selling the refurbished power tools directly to prospective customers, the service center can sell to agents which are renting different combination of tools to customers. The rental (Pay Per Use) business model was and active pilot project during this study period by Indian subsidiary.

6.4 Refurbishment cost estimation and selling price calculator

During this study a user-friendly tool was developed. This tool has two sections, cost estimation dashboard and selling price calculator. A brief detail of the tools developed and logic behind is explained in the following sub sections.

6.4.1 Cost Estimation Dashboard

The first tool developed was refurbishment cost estimation dashboard. This part of the tool is designed to help the service technician at the service center to identify the tools which are fit to continue refurbishment. The figure blow shows the different components of the cost calculation.

Figure 14. Refurbishment cost estimation dashboard (Specific costs are hidden).

The cost estimation dashboard is necessary because none of two used power tools which come to service center are in the same working condition and status. The service center can use this tool in the decision-making process for refurbishment alongside Power Tool Diagnostic Program. The service technician starts with selecting tool category in the drop-down menu. After diagnosis and fault finding, the technician feed in different spare parts to be replaced. The program is

connected to a database with spare part prices for different models, recommended repair time and fault finding. The program also takes into consideration detail operational costs at the service center to perform refurbishment including fixed cost, variable cost, administrative and logistics costs. All these costs together with the minimum price allocated for the used tool adds up to give the total refurbishment cost for the power tool which is displayed at the end of the calculation and on the dashboard at the right side.

The service technician uses the cost estimation calculator to decide whether the used tool is fit for refurbishment or recycling. The cost estimation dashboard is designed with three colors: green yellow and red. The reference for this color indication is the price which the customers are willing and capable to pay for refurbished power tool. This price is based on the customer survey undertaken during the study under financial feasibility section. Green section indicates the refurbishment cost is minimal and go ahead with refurbishment process. Yellow section shows the refurbishment cost is still acceptable. While if the refurbishment cost is under the red section, the cost is too high, and the used tool is not suitable for refurbishment. The tools in the red section go for recycling.

6.4.2 Selling Price Calculator

Developing new sales structure and strategy is not in the scope of this study. This sales price calculator is developed to showcase the two options of calculating a price and will be used as a base for future development.

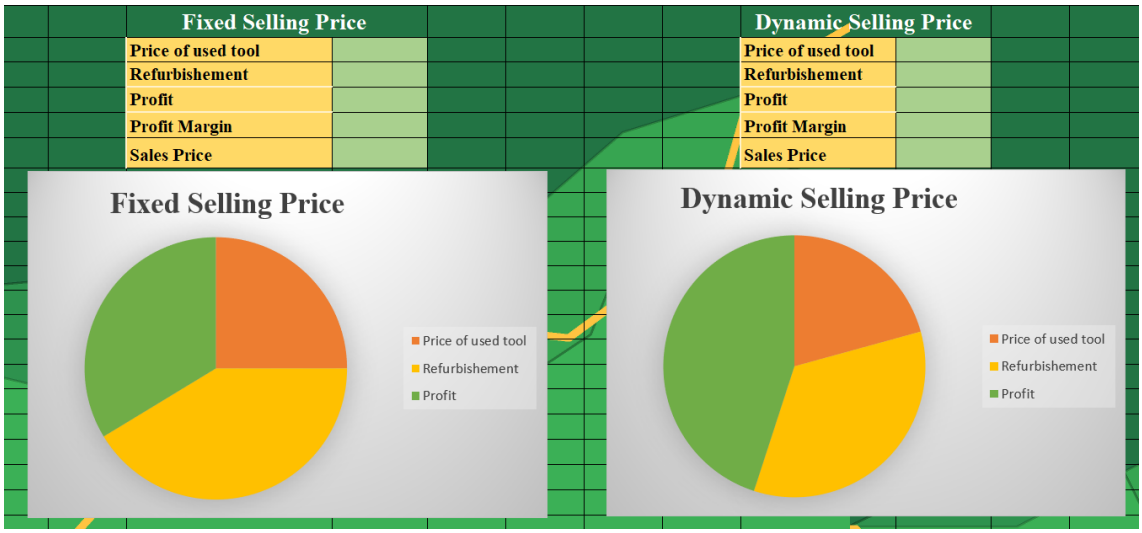

Figure 15. Fixed Vs Dynamic selling price (Specific numbers are hidden)

Figure 15 above shows the two pricing options for selling refurbished power tools to B and C class customers. In fixed selling price, the price of all refurbished tools is pre-determined. Depending on the cost of refurbishment of a tool, the profit margin can go up and down. While in dynamic pricing strategy, the profit margin is fixed, and the selling price vary depending on the status of the refurbished power tool. Dynamic pricing is a most commonly used strategy used in bench-marked industries during the study.

7 Validation of the Feasibility Report

This section of the study validates the feasibility report and first draft of refurbished power tools operations at central service center presented in section 6. Validation has been done involving all key stakeholders in Finland and India. The aim of the validation was to make sure that the feasibility report and the recommendations are valid practically. The final feasibility report and refurbished power tools operation recommendation are presented at the end of this section.

7.1 Overview of the Validation Stage

The draft feasibility report and preliminary recommendation on the refurbished power tools operation was based on the body of knowledge from literature and findings from the data collected as stated in conceptual framework. The validation was conducted on a webinar together with stakeholders. The main stakeholders participated were Head of portfolio management (Finland), Power tools Portfolio Manager (Finland), Services Portfolio Manager (Finland), After Sales Manager (Finland), and Marketing Manager (India). The findings of the study and the recommendations were presented and discussed. During the webinar each participant was given a chance to validate the first draft and give their feedback.

7.2 Findings of Webinar (Data Collection 3)

The draft feasibility report and recommendation for refurbished power tool operation presented in a webinar. All key stakeholders are actively contributed in the co-creation of the first proposal, so the validation mostly focus on detail discussions and feedback session. The proposal received some improvement suggestions and insights. All the feedback is taken into consideration in developing the final feasibility report and final recommendation presented to the management.

Based on the analysis of the data 2 collected, all stakeholders agreed with the three parts of the feasibility sections: operational feasibility, target market feasibility and product/service feasibility. The tool developed to calculate the cost estimation of refurbished power tool and selling price is a good tool to the current and future service center operation. The case company have a sales structure designed for high profit margin new power tools. Currently the company is not in a position to setup a new sales structure only for refurbished power tools. Using the current technical sales structure and setup is costly. This aspect was taken into consideration while developing the final feasibility report.

When the refurbished power tool operation at the central service center discussed, the discussion was based on the three sections. The feedback and inputs for the three sections of the operation are discussed briefly in the following paragraphs.

Incoming Power Tools: Having different sources for used tools is good to source higher number of tools for refurbishment. In the first proposal five different sources of used tools were recommended. However, tools from third party repairers is not an ideal source. The main business of these repairers to fix faulty tools. Even if we get the tools from these partners, it will be in a very bad condition to be refurbished. It is evident that during the period of the study there are many power tools in Europe than in India. Europe can be a big potential to collect the used tools for refurbishment in Indian service center. However due to regulation of importing and recycling used tools in India, the process will be demanding and complicated. Sourcing used tools from Europe to India is not a feasible way at the moment.

Refurbishment: The proposed refurbishment process is directly related to the central service center operation. It can easily be integrated to the current after sales operations. Based on the first proposal, after fault finding and diagnosis the tools which are not fit for refurbishment go directly to recycling. Instead of recycling the whole power tool, there is a possibility to harvest some spare parts and save for future refurbishment. This will enhance the case company's target to become a sustainable company.

Outgoing Tools: The proposed direct sales of refurbished power tools to B and C class customers by the case company is a better option than involving third party agents. Even though it is easier to reach more prospective customers through agents, warranty and other technical issues which are not in the scope of this study.

7.3 Final Recommendation of refurbishment operation at India service center

Refurbishment at the central service center in India is chosen as a primary business case. This gives the case company end-to-end transparency and control over the refurbishment operation which enables the collection of data and facts for future development.

The summary of the final recommended refurbished power tool operation at Indian central service center is presented in this subsection. The feedbacks and suggestions from key stakeholders during the validation webinar are incorporated to enrich the final recommendation. These ideas are on sourcing the used tools and one additional process in refurbishment of the tool. While the outgoing channel for refurbished tools proposed in chapter 6.2 is accepted. The updated flowchart of the recommended operation is given in figure 16 below.

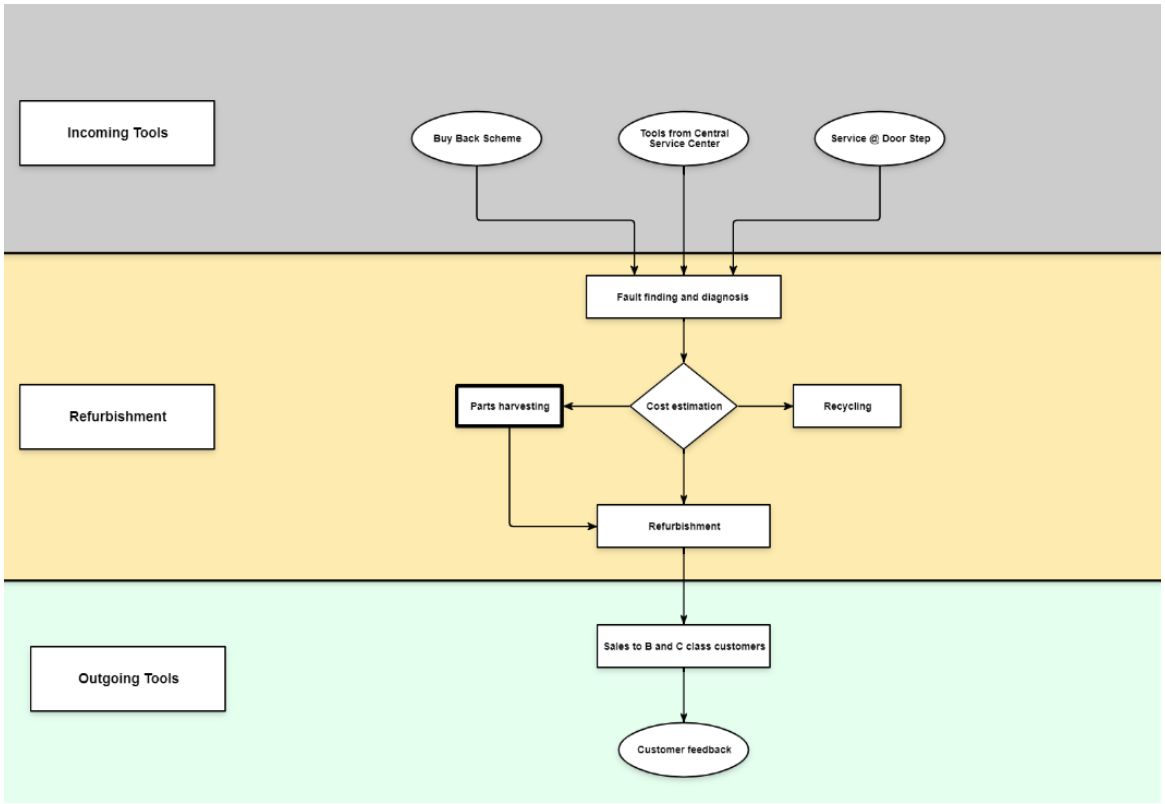

Figure 16. Updated flowchart of final recommendation of refurbishment operation at India service center

Based on the feedback from the Indian subsidiary, Europe as a source of used power tools for refurbishment was investigated after the webinar. The Indian tax and environmental authorities are consulted, and it is evident that the import of used tool from Europe to India is not feasible at the time of the study.

The case company is moving to become environmentally responsible sustainable in its strategy. In addition to creating additional income stream to the company, the refurbished power tool project is aiming at investigating possibilities to achieve strategic sustainable goal. Based on the technical assessment and diagnosis of the used tools coming to the service center, the tools are identified as suitable or not for refurbishment. The tools which are not fit for refurbishment is considered as a source of spare parts for future refurbishment. Tool harvesting and temporary storage is included in the final proposal to be more cost efficient and sustainable instead of using new spare parts for every refurbishment.

7.4 Final Feasibility Report

The final feasibility report for refurbished power tool busines in India is based on the data collected from prospective customers and key stakeholders. Based on the conceptual framework developed from best practices on conducting feasibility study, the four main section of the feasibility study are deeply studied and analyzed. The figure 17 below shows the final decision support system developed on section 3.3.5.

Figure 17. Final Feasibility report

Operational feasibility

Operational feasibility evaluated the organizational and technical capabilities of case company's central service center in India. The service center has extra capacity in the current service center to handle refurbishment. Even though there is a need to integrate the refurbishment business operation to the current after sales operation, it is clear that the organization has technical and organizational capability to handle the proposed business idea.

Target market feasibility

Target market feasibility investigated the intention of buying for the target market segment. B and C class customers are excited about the refurbished power tool offering. There is a great demand for refurbished power tool and the target market is feasible.

Product / service feasibility

Product / service feasibility assessed the desirability of the refurbished power tools to the prospective customers. Based on the market research conducted during this study, the proposed product is feasible. It meet the requirement of the target customers. B and C class customers are willing to try refurbished power tool to reduce operational cost, increase their efficiency and create a better working environment.

Financial feasibility

Refurbishment cost estimation and selling price calculator tool developed as part of this study together. This tool was used to analyze the detail cost structure to analyze financial feasibility of refurbished power tool business at case company's central service center in India. Different business case scenarios were deeply analyzed and evaluated. ROI calculation was used to calculate the fixed and variable operational costs. Since the central service center has extra capacity in the current service center, there is no need to have big initial investment on infrastructure. The case company has a well-developed technical sales structure which is designed for premium quality new power tools. Using the same sales structure for refurbished power tool is too expensive. With the current organizational setup and sales structure, the refurbished power tool business is not financially feasible.

In conclusion, the overall refurbished power tools business case in India with the current organizational structure and technical sales setup is not feasible. This completes final feasibility report and recommended refurbished power tool operation at central service center in India. In the next chapter the overall thesis project is summarized followed by recommendations and closing words.

8 Discussion and Conclusions

In this final chapter of this study executive summary of the thesis project is presented. The final outcome of the study is assessed with the achievement of the initial business challenge and objective. Executive summary is followed by recommendation for next steps and evaluation of the overall thesis project.

8.1 Executive Summary

Sustainability is becoming increasingly important for companies focusing on long term growth rather than short term gains. The case company has taken an initiative to move towards becoming a sustainable and socially responsible company. The company is a world leader in surface finishing technology with groundbreaking sanding solutions. In addition, the company offer tailored and wide range of system solutions with superior innovative power tools. The headquarters and production facilities of the case company are located mainly in Finland. More than 97% of products are exported and distributed to over 100 countries. The case company has 18 subsidiaries all over the world.

A subsidiary from India, show a great interest in refurbished power-tools as an alternative solution to reach class B and C customers. The business challenge emerged as there was no developed business case. The scope of this study was limited to India as a pilot project. By using the learning from the pilot project, it can be scaled up and replicated to other markets as well. Therefore, the main objective of this study was to conduct feasibility study of refurbished power tools and make recommendations on refurbishment operation for management.

Firstly, this study started with by identifying a business challenge. Once the business challenge identified, the objective and outcome of the thesis were set. Key concepts on sustainability, circular economy and refurbishment also enrich the introduction part. The study continued with choosing a proper research design and methodology to fulfill the objective and outcome. Literature review was done before current state analysis since there was no developed business case for the proposed business idea at the start of this study. A conceptual framework of feasibility study with four major sections was developed based on the best practices from scientific papers and publications. Each of the four sections of the feasibility study were deeply analyzed.

Current state analysis was performed by collecting data from different sources. Data collected from company's internal documents and publicly published sustainability report. Market research was done by Indian sales and marketing team. Face to face interviews and virtual webinars were handled with key stakeholders. The current sustainability initiatives of the company in general and ongoing pilot projects specifically in India were briefly discussed also. Even though this feasibility study is conducted for Indian market, in addition the current aftersales operation of Belgium service center was also considered in order to benchmark and learn from the best practices.

Based on the facts from data collected, a preliminary feasibility report and recommendation of the refurbishment operation process was developed and presented. The draft process and report are validated by the key stakeholders in Finland and India during a virtual webinar. Finally, after incorporating the feedback and inputs from the validation webinar, final feasibility report and recommended refurbishment operation process was made and presented to the management.

8.2 Next Steps and Recommendations

The case company's commitment to become environmentally sustainable by developing innovative products which are safe to use are highly appreciated by the current and prospective customers. This position the company as a premium brand the customers' eye. The customer survey indicates there is a great demand for refurbished power tools among B and C-class customer groups. Currently the company has one central service center in India with extra capacity and planning to open second center in different geographical location in India. Handling refurbishment business can enhance the efficiency of the service centers while reaching the untapped prospective target market. The proposed business operation can easily be integrated to the current after sales operation in the existing service center with additional resources.

Based on the findings of this thesis, the overall refurbished power tool business idea is not feasible with the current organizational and technical sales setup in India. Even though, the proposed business idea is feasible from technical and organizational perspective, it is not financially feasible. This conclusion does not mean that the business idea is obsolete in all marketplaces that the company is operating currently.

This study together with the financial calculation tools developed will be used as a reference and starting point. For future development of the business case, this thesis recommends the following. Firstly, the case company should investigate a separate sales strategy and structure which can make the business case financially feasible. E-commerce is becoming a major trend; it would be wise to start looking into the possibilities of using either own platform or third party developed online stores. The sales of refurbished power tools also increase the sales of abrasives and accessories. Secondly, it would be advisable to study the pros and cons of the refurbished business on the brand image. The brand is perceived as a premium by the customers in the target market. If the refurbished business is communicated well the potential customers, it will create a chance to position the brand as sustainable premium in the industry. There is a need to create a system that easily identify the refurbished and new tool in the marketplace. Otherwise it will negatively affect the brand image.

Thirdly, warranty and system integration to the existing aftersales operations need to be deeply investigated. Fourthly, it is worth noting that the warranty issue is not included in the scope of this study. From the market research, it is shown that warranty coverage is one of the three major factors affecting the purchase decision of the prospective customers. Finally, it would be idea to integrate the refurbished power tool business idea with ongoing pilot projects in services portfolio like Pay-Per-Use or rental business model.

8.3 Thesis Evaluation

In this section the overall thesis is evaluated based on the alignment of the initially stated business challenge, objective, and final outcome. The thesis project met the objectives set at the beginning of the project. Feasibility report was compiled and recommendation on the refurbished power tools operations was presented to the management. Thesis evaluation was performed based on evaluation criteria such as validity, reliability, relevance, logic, and credibility throughout the project.

To ensure reliability of the thesis, different data sources were used such as company documents, publicly available sustainability report, market research, interviews, and webinars. The conceptual framework was developed based on multiple best practices and body of knowledge from different disciplines. Field notes were taken, and all virtual meetings and webinars were recorded with the permission of the stakeholders. Confidential data was used for price calculation so not published on the final thesis.

The study performed logically starting with identification of a business challenge and setting objective followed by literature review. Conceptual framework based on best practices was developed and used to perform current state analysis. The data collected from different sources were used to develop the initial report and recommendation. Final feasibility report and recommendation of refurbished power tool operation process was developed by incorporating the feedback and inputs from key stakeholders. The case company's management and key stakeholders were satisfied with the project and considered this study as relevant for future business model development in the future.

8.4 Closing Words

The case company place sustainability as a priority in every operation of the company to create sustainable business in the long term. The company strive to operate all business operations and manufacturing with reduced environmental impact and ensure the health and safety of the workers and end users as well. Developing innovative business ideas which back up the strategy of the company that fulfill the requirements of the regulatory institutions is the key to continue being a leader in the industry. Customers are becoming more environmentally conscious and demanding innovative business models to set the brand as the best choice in a competitive business environment. Accepting and validating the feasibility of new ideas at every stage of the organization including all subsidiaries in different parts of the world by allocating enough resources secure long-term profitability of the firm.

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Refurbished power-tool customer survey questionnaire

Name of body shop: _____

Interviewer: _____

Date of interview: _____

Total interview and discussion time: _____

Rationale for interview:
Case company is planning to start offering refurbished power-tools for B and C class customers who otherwise do not have possibility to buy brand new premium quality power tools. The main objective of this interview is to map the needs and expectations from potential future customers.

1. Do you use power tools, or you do the sanding with hand at the bodyshop?

Ans: _____

If YES:

2. What kind and brand of power-tools currently are you using at your body shop?

Ans: _____

3. Do you know Case company as a brand?
    a. Yes, I know Case company as a brand and I have used its products often / frequently
    b. Yes, I know Case company as a brand but never used the products before
    c. No

4. How do you rate Case company's brand?
    a. Very premium b. Premium c. Medium d. Low Quality

If NO:

5. Would you be interested in using a tool?

    YES NO

6. What type of tools to start with:

    a. New Tools b. Refurbished Tools

7. What are your expectations from refurbished power tool offering in terms of quality and warranty?

8. What, do you think, are key factors you will consider buying a refurbished power-tool? Discuss the top 3. (Quality, Performance, Warranty, Outer appearance, Aftersales Customer service…)

9. If case company's refurbished power-tool is available today, how likely would you like to buy the power-tool?
   a. Extremely likely b. Very likely c. Somewhat likely d. Not so likely e. Not at all likely.

10. How much are you prepared to pay for refurbished as compared to the brand-new Power-tool?

    a. INR **** b. INR **** c. INR ****
    d. INR ****

11. Valuable recommendations and comments to be considered in refurbished power tool offering.

12. Can we take some pictures of the workshop? It will only be used for this study it will not be published without the permission of the body shop.

13. Would you be interested in pay as per usages concept?

    YES NO

14. What would you pay for an eight-hour shift for the below tools?

    a. 1 Sander : INR……/-…….

    b. 1 Sander + Dust Extractor : INR……/-……

    c. 2 Sanders + Dust Extractor: INR …/……

    d. Sander with Dust Bag: INR……/-……