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Availability of Escalator Spare Parts for Major Repair Services Business Model

Helsinki Metropolia University of Applied Sciences

Master's Degree

Industrial Management

Master's Thesis

25 April 2013

PREFACE

With this Thesis, I'm finalizing my studies in the Master's degree Program in Industrial Management. It has been a long road which started with preparations for the enrolment process in a Finnish University of Applied Sciences, and then, when selected, continued as a participant in the programmed which became a really invaluable experience. The period of studies was so rich in literature and practical examples on innovation and customer value creation, and shaping a better perspective on global business trends, that it opened my eyes to a completely new world. Although I had a strong background in manufacturing process, I could realize the impact of global business on our everyday life.

I'm very so thankful for these lessons that widely supported my professional life. I also enjoyed a lot since this program gave me the opportunity to meet interesting people among my classmates and professors. I would like to express my special gratitude to my instructor, Dr Marjatta Huhta, for providing with guidance and having enormous patience during this process. I'd like to also thank Dr Thomas Rohweder for his highly appreciated comments and contributions to my Thesis, as well as Zinaida for all her assistance during the entire program.

I would also like to thank to my colleagues in KONE, first of all, Harrison Okuogume for his suggestion to study for a Master; my Manager, Mr Angelo Marseglia for providing me with the required time to conduct my studies, and Jani for sharing his knowledge in escalator business.

This Thesis has been a real challenge to combine with my personal life, for such I would like to thank my wife, Anne, for her patience and support for support in all the challenges we experienced during the time of my studies. Without her example of strength, perseverance and courage, I would not be able to conclude this study. Finally, my best wishes go to my new-born son, who has brought a new light in our lives.

Arturo Ordoñez

15th of May 2013

Author Title Number of Pages Date	Arturo Ordoñez Availability of Escalator Spare Parts for Major Repair Services: Business Model 66 + 8 pages 5 May 2013
Degree	Master Degree
Degree Programme	Industrial Management
Instructor	Marjatta Huhta, DSc (Tech), Principal lecturer
<p>This Thesis examines the current ordering process for major repair projects and its implications for availability of the spare parts.</p> <p>The objective of this Thesis is to develop a process as a business model for KONE Global Spares Business for ordering spare parts for repair projects in escalators. This enquiry has become necessary since KONE GSS has targeted to increase its service performance by modifying its strategy from being a spare parts provider to a solution provider for any business case in escalator spares.</p> <p>The suggestion behind developing this business model is based on the local solutions used by KONE Units in other countries at a local level but not yet shared globally. The purpose of this project is to develop a process that would help increase the offering of solutions and further develop KONE GSS as a service and solution provider. The outcome is the business model which would assure availability of the spare components for major repair projects in service escalator business.</p>	
Keywords	Repair business, escalators, Global Spares Supply, business model, SAP.

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Acronyms

APM	Association of Project Management
CMII	Contribution Margin II
CRM	Customer Relation Management
CVP	Customer Value Proposition
GSS	Global Spares Supply
FL	Front Line
GR	Goods Receive
GTS	Global Technical Services
IT	Information Technology
MOD	Modernization
M&R	Maintenance and Repairs
NEB	New Equipment Business
PO	Purchase Order
R&D	Research and Development
RFQ	Request for Quotation
SAP	Systems, Applications and Products in Data Processing
SO	Sale Order
SRC	Service Reception Center
SRM	Supplier Relation Management
TRB	Tendered Repair Business

1 Introduction

This Thesis focuses on developing a model for the ordering process for major repair projects in escalators which involve supply of spare parts.

1.1 Business Problem

In our current life, mechanical devices such as elevators, mechanical escalators and automatic doors can be found wherever people need to move from one place to other. The capability to keep the equipment in an operational condition is a constant challenge for the customers, since unplanned interruptions or failures of the equipment at any level, might drive to consequences from operational losses up to severe injuries. For the providers, however, besides these challenges, the capability to keep the equipment in optimal operational condition also present valuable business opportunities.

1.2 Case Company

The case company of this Thesis, KONE Corporation, is one of the global leaders in the elevator and escalator industry. For a long time, it has been focusing its strategy on increasing and developing its participation in the maintenance and modernization service business worldwide. The company's objective is to offer the best *People Flow* experience by delivering solutions that enable people to move smoothly, safely, comfortably in an increasingly urbanized environment. (KONE Website) In KONE strategy, price solution, delivery time, and availability of spare components have been the key criteria to acquire new customers and win service maintenance contract or take a modernization solution.

In the case of escalator equipment segment, these modernization solutions have become and a more frequent option offered to customers in order to upgrade the equipment and keep it in operative conditions. Since KONE introduced mechanical escalators in its portfolio of products as a building solution in the 1950's, more than 45.000 KONE escalators have been manufactured and installed around the globe. Of them, approximately 15.000 equipment were manufactured more than 25 years ago. For such equipment, when a technical failure occurs, modernization packages can be proposed as a solution to replace and upgrade the old broken components and installations. The

customers, however, might not be able to afford such a solution due to financial or technical reasons.

Currently, some alternative solutions, in terms of major repair services, started emerging, since several KONE units around the world started providing repair service as a solution for broken equipment. Such solutions, however, are typically performed and managed by technicians within their own networks of known suppliers or companies who are able to supply these rare components. Furthermore, the scope of such projects has been very limited and only based locally, and without any defined processes, or supply chains or regular supplier relationships.

As a result, these major repair services are not yet established within KONE organizations as a process or a business model. The key obstacle for such contracts still lies in the availability of spare components. Among any other resources needed for these maintenance projects, spare components element takes a very specific place due to its potential impact, first, on reliability of maintenance and repair solutions, and, second, as availability of these spare parts.

The availability of spare or repaired components for repair projects is a critical factor in many aspects, such cost and reliability, since components for old escalators, in many cases, might not be manufactured any longer. Their production may not be profitable for manufacturers anymore, or technical information might not be available. In order to keep the availability of spare components, it has been necessary for companies and organizations to build and develop a proper supply chain process, which according to Stanebau (1996), should be built around such elements as the product quality, product price and product supply, all essential in the supply chain management. Furthermore, a world-class supplier base needs to be developed in order to be more competitive globally, and not reduce these activities only to a local level.

This Thesis will, thus, focus on developing the process for providing spare components for major repair projects in escalators which can be applied on a global scale within KONE organizations and KONE Global Spares Supply in particular. The ultimate goal of this project is to increase the market share and provide solutions to customers with old equipment which would take into consideration their budget or technical limitations.

1.3 Research Objective and Research Question

The research objective of this Thesis is to develop a business model for KONE Global Spares Supply that can assure availability of spare components for major repair projects in escalator business. Another, wider objective, it to develop the model which would offer this solution on a global scale to other KONE units in order to transform it from the current local repair scope, and increase KONE competitiveness as a solution provider.

The proposed business model should also provide KONE units with the possibility to transfer their ordering and handling of components for major repair projects to KONE Global Spares Supply. The developed supply chain processes for delivering spare components for maintenance and modernization projects should also establish its presence in KONE GSS portfolio as a capable and defined supplier based process available worldwide. The model aims to assist other KONE units in their knowledge and experience in providing them with manufacturing and repair of components. In order to improve the availability of spare components, KONE Global Spares Supply has become a strategic solution developer for supply spare components.

Currently, within the KONE organization, KONE GSS is providing most of the required components, maintenance and service business and it has been seen as a major partner in assistance for major repair projects. By now, KONE GSS developed mature supply chain processes in the delivery of spare components. In addition, it handles contract coverage agreements with strategic suppliers for major repair projects, and since then it has been perceived as a promise to increase KONE GSS market share and business service integration along with the other front line units.

Another business process that KONE GSS can develop is the ordering process for major repair components done internationally. This sector represents a challenge since it is necessary to define and prepare the ordering of the components for a big business segment, while the current processes in KONE GSS are defined only for maintenance business.

In light of the present research objective, the research question(s) for this Thesis can be defined as follows:

How to assure availability of spare parts for reparable escalator equipment?

This question is considered for this Thesis based on the current conditions which have generated difficulties in keeping available spare components for escalators in service business and major repairs.

In addition, this Thesis aims to thoroughly analyze the current ordering process in KONE GSS to take it into account. The current KONE GSS ordering process creates administrative problems, every now and then when spare components are required for service and major repair projects. Defining the process structure for ordering of the components for service and major repair projects will provide benefit the company by improving its competitiveness in terms of obtaining new clients, reducing the delivery time, price offering and cost saving, and, on the other hand, reducing the efforts by KONE GSS currently invested in this process. Overall, it should produce a competitive solution for other KONE units in their needs for components for major repair projects.

This Thesis focused on analyzing this business opportunity and suggesting a business models for improving the ordering and handling process.

1.4 Structure of the Thesis

This Thesis is written in six sections. Section 1 presents the Introduction. Section 2 describes the data collection and research methods used in this Thesis. Section 3 provides the finding from the literature review based on the concept of service business and its implications for maintenance and repairs. In addition it provides the reader with a description of the theoretical framework used for building the initial business model . Section 4 presents the results of the current state analysis and results from the workshops. Section 5 overviews the building of the process model, and verifies and establishes the process. Finally, Section 6 presents the discussions and conclusions on the results of this study.

2 Research Methods and Materials

This section described the data collection and the research methods used in this Thesis. The study applies qualitative research methodology based on the action research approach. This methodology is chosen for this study to allow for a deeper analysis of the actions which can be taken to improve the current situation in the case company.

2.1 Action Research Design

According to Rowley (2003), action research can be described as an approach that encourages students to acquire the habit of a researcher in the work place and provides with an approach that teach them critically evaluate their practices.

Coghlan and Brannick (2001) have describe action research as a cyclical process of *planning, taking action, diagnosing* and *evaluating* the steps taken. They propose an action research cycle which involves four main stages, as described in Figure 1 below.

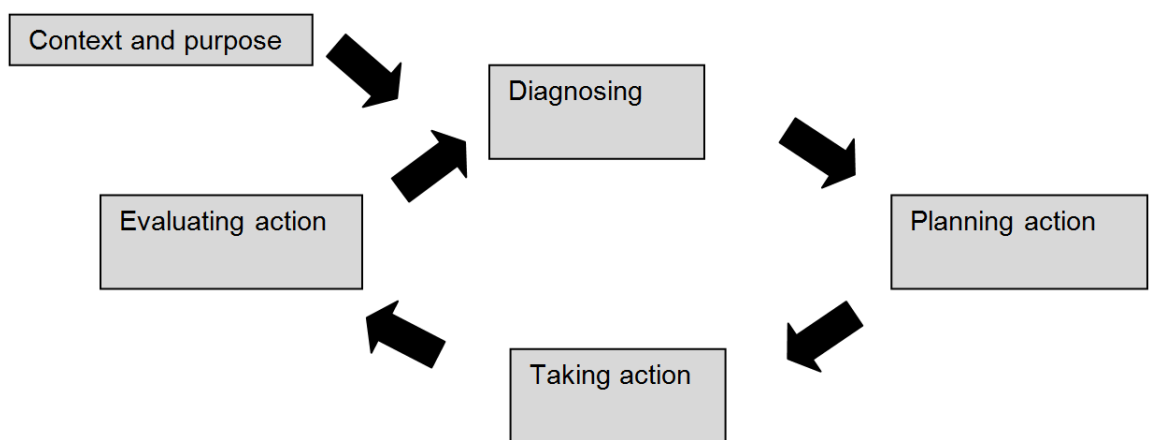


Figure 1. Action research cycle (Based on: Coghlan and Brannick 2001).

Figure 1 describes the action research cycle based on the views of Coghlan and Brannick (2001). This cycle is described as starting from the preparatory stage, focused on the establishment of the context and purpose for the action research. The first stage describes the *diagnosing* phase which is concerned with the identification of the issues and therefore focuses on the action needed. The second stage refers to *the planning* of action, which considers the current situation of the business case. The fourth 4 de-

scribes *the actions taken* in order to implement the action plan. The final, fifth stage, *evaluates* the outcome of the action.

Based on the action research cycle described in Figure 1, and the research cycle in this study also has similar stages. The research process in this study is presented in Figure 2 below.

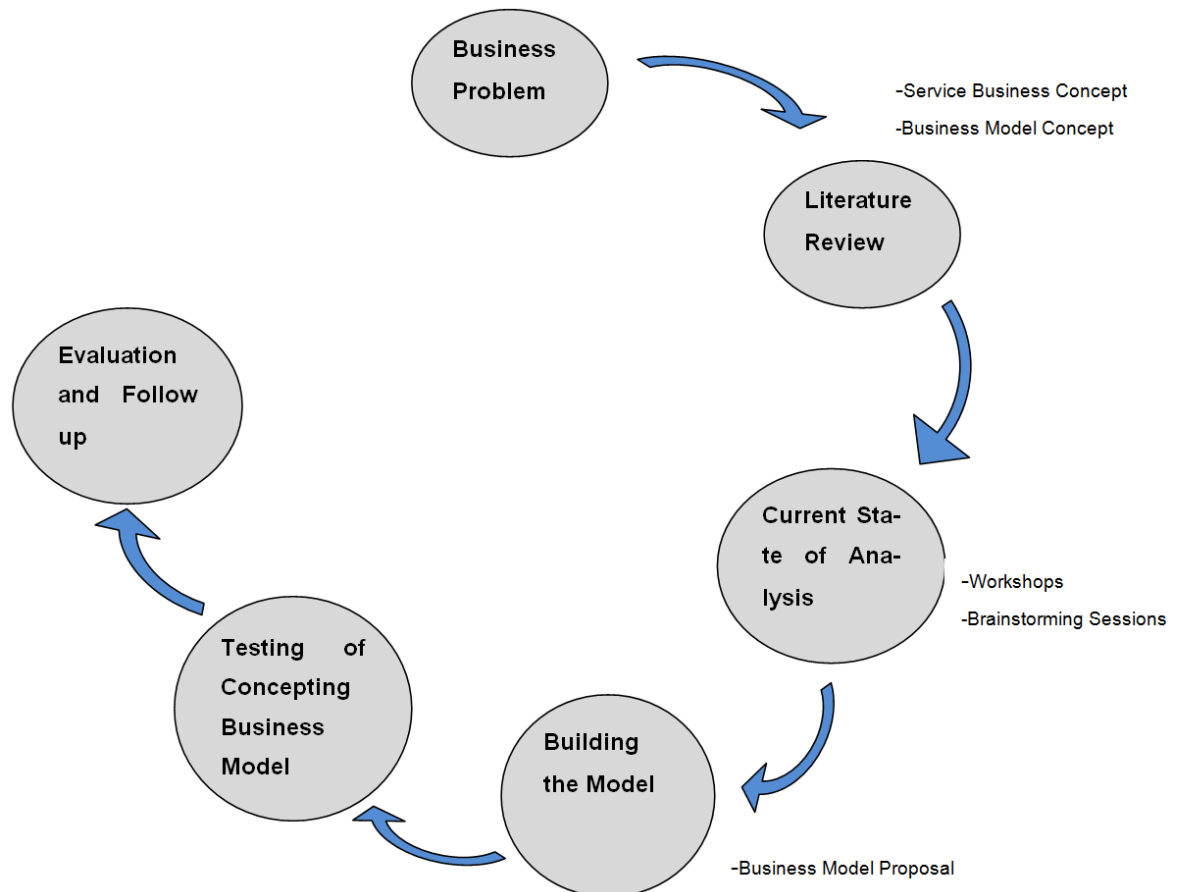


Figure 2. Research design in this Thesis.

As shown in Figure 2, the cyclical process in this Thesis starts with identification of the business problem (How to assure availability of spare parts for reparable escalator equipment?), which corresponds to the preplanning stage in the action research cycle by Coghlan and Brannick (2001).

During the first stage of the action research, business models are investigated based on the literature reviewed by considering several business models and reflecting on the specifics of the repairs and maintenance business. During the second stage of action research in this study, the current state analysis is conducted, in which the data is collected from several data sources such as interviews, workshops and discussions. The

third stage of action research in this study discusses the model to be built according to the data collected and the theoretical framework. The fourth stage displays the business model proposal and its implications when tested. As the sixth stage, the business model has been validated with the company experts and evaluated.

2.2 Data Collection

Collecting high quality data is essential for the success of any project (Laman 2007:40), either process improvement or new product development. Lannacone (2004) also argues that data collection can work as a management tool which works to ensure product quality and increase in productivity.

In the case of this Thesis, data were collected from different sources which are described as follows: 1) the current internal information available within the organization; 2) the market data for global economic trends; 3) suppliers' Information; 4) data collected from technical experts.

If described by type of the data and method of analysis, data collection for this study was conducted through interviews, discussions, brainstorming sessions and workshops among the employees in the related areas. Such activities were developed on a scheduled basis since the need to gather information from all the involved sources required visits to the supplier's side and interviewing and discussing with other KONE units located in other countries. Additionally, in KONE GSS three brainstorming sessions (for the current state analysis) were conducted with Customer Service Manager, Escalator Senior Technical Services, Sourcing Specialist, Project Manager, Operations Manager, Sourcing Category Manager. During the discussion, the current ordering process and its implications with other areas were discussed in order to define the current status and further actions to improve it.

The three brainstorming sessions conducted for the current state analysis are shown in Table 1 below.

Table 1. Brainstorming sessions in KONE GSS with its multifunctional team.

Number	Participants	Duration	Position of the participants	Date
1	6	1 ½ hours	Team leaders / Man-	December 2012

2	6	1 ½ hours	Team leaders/ Management team	January 2013
3	6	1 hour	Team leaders/ Management team	February 2013

Table 1 describes the first brainstorming sessions conducted by the researcher in order to have an overview of the current process in place and collect the colleagues' opinions on its challenges and the way to improve it. It was necessary to have more brainstorming sessions for this purpose, but the time limits of the study were very tight. Field notes were taken in order to conduct data collection and analysis. The first series of brainstorming sessions was necessary to conduct in the multifunctional team.

After the first brainstorming sessions, it became obvious that individual interviews were necessary to have, with individual interviewees within KONE GSS (from the involved areas) and from other KONE functions. This need came due to collect more information for escalator business globally.

Table 2. Interviews within GSS and other KONE functions.

Interview number	Position of the interviewee	Date
1	Sourcing Category Manager	January 2013
2	Escalator Spares Specialist	January 2013
3	Portfolio Manager	January 2013
4	Customer Service Officer	February 2013
5	Purchaser	February 2013
6	Escalator Project Leader	March 2013
7	Escalators Global Product Manager	March 2013
8	Escalators Mechanical Design Engineer	March 2013
9	Project Manager	March 2013
10	SAP Business Analyst	March 2013
11	Escalator Development Program Manager	April 2013

Some interviews shown in Table 2 were face to face, some were conducted as phone calls or video conferences. Such conference calls lasted for at least one hour, with field notes taken in order in order to conduct data collection and analysis.

In addition to the first series of brainstorming sessions, more sessions with external suppliers were organized in order to collect their current views and share knowledge in the spare parts business. These brainstorming sessions were organized on different supplier premises.

Table 3 shows the brainstorming sessions held with suppliers.

Table 3. Brainstorming sessions with Suppliers.

Number	Participants	Participants position	Duration	Location	Date
1	4	Key account managers / Technical Specialist	2 hours	Grafschaft- Gelsdorf/Germany	January 2013
2	4	Key account managers / Technical Specialist	2 hours	Sprock- hovel/Germany	January 2013
3	3	Key account managers / Technical Specialist	1 ½ hours	Heiligen- haus/Germany	January 2013
4	4	Key account managers / Technical Specialist	3 hours	Forchten- berg/Germany	January 2013

As described in Table 3, during the sessions with the suppliers, the business challenges of keeping the old escalator components available were discussed. During these sessions, field notes were taken by the researcher in order to be presented the results to the multifunctional team for future discussions.

Finally, one workshop with several KONE frontlines was scheduled in order to share information and experiences in the ordering process of spare parts and solutions used in their daily business. The details of this workshop are described in Table 4 below.

Table 4. Workshop for major repair field reference Group Escalator

Number	Participants	Participants position	Duration	Location	Date
1	20	Sourcing Specialists/Technical Specialists/Product Managers/Modernization Manager/Logistic Manager	2 days	Herten, Germany	February 2013

Table 4 describes the participants at the workshop. The target of the workshop was to share information in order to be implement the proposed ordering process for increasing availability of the spare parts and developing solutions for major repair projects.

2.3 Reliability and Validity

According to Scarisbrick-Hauser (2007), effective data analysis means that the data is analyzed, interpreted and integrated into the context of business decision making. Yin (2009:45) describes *reliability* as the capability to display the same results while using different data collection methods. In addition, reliability refers to the ability to apply an established theory from one area to another, collecting data at different points of time and using different researchers at different parts of the research. Furthermore, the objective of reliability is to assure the repeatability by using the same research methodology and techniques in order to provide the same answer. On the other hand, Creswell & Miller (2000) claimed that the researcher opinion and his ability to observe can affect the validity of the study in either a positive or negative way.

According to Maxwell (1996), the validity includes the accuracy and correctness of data collection. In this Thesis, the validity relies through the state analysis, interviews, workshops and brainstorming sessions and their respective analysis. Furthermore, the obtained data can be validated by the brainstorming/workshop sessions with experts as participants. On the other hand, open mindedness and less prediction of the outcome are required in order to get unbiased results. With this vision on validity of the data and its analysis methods, the business model can be designed, validated, and interpreted.

Testing validity relies to the question of “was what was found a response to what was originally asked?” (Quinton and Smallbone 2006:127) To answer this question, the validation for this Thesis considers two types of validity, construct validity and external validity. Construct validity refers to the use of multiple sources of evidence and data analysis; and external validity refers to the use of theory in the business case, which in this Thesis, is based on the literature review to build the business model. (Yin 2003:34-39)

The results of validity and reliability of this Thesis are described in Section 6.3.

3 Service Business Model for Repairable Escalators

This section provides an overview of the service and maintenance business and its implications for the repair services. At the same time, it presents the business models by selected authors available in the literature to help consider building a business model for the GSS case.

3.1 Service Equipment Business

To gain competitive advantage in a fast changing environment, companies must continuously adjust their business strategies to fit in global markets in order to keep competitiveness and attractiveness for customers. An important strategy for increasing competitiveness is by developing and maintaining good customer relationships, such development is conceived with the concept of customer satisfaction.

As a method to be used by an organization in order to ensure customer satisfaction is to provide what customers really need and want. However, in most of the cases, customers' needs and wants change from time to time. Specifically, for a company which strategy is driven through service business, it is critical to cope with this problem (Liu and Wang 2008: 1500).

With such needs and wants in market trends, organizations are in an evolutionary process, which lead to the situation that good manufacturers find themselves a unique position to grow their revenues through the desired manufacturing and service offerings.

Offering services is a prerequisite for establishing long-term relationships based on trust between the clients and contractors. Long-term relationships with customers are seen as a prerequisite for competitive advantages of a company (Straub 2011: 172). However, due to adjustments in the company's scope, this approach has been driving companies to the path where organizations must learn how to leverage unique resources and build distinctive capabilities.

These capabilities, have determined that the service business has become an important growth area in manufacturing industry. It is because most of manufacturing companies have already reached a stage of competitive maturity with respect to their products. After that, these mature manufacturing companies start focusing on their global

service operations. This trend has been intensified by a change in the business model of manufacturing industries.

With the change of approach, making companies to drive to providing services, manufacturing companies have to cope with increasingly lower margins in the product business and compensate for this by extending the service business. In some industries, products are even sold at a cost level, thereby increasing their market share of the installed base, leading in turn to the increased revenue and margins from their service business (Brax 2005: 142). On the other hand, other authors argued, that driven by strategic and financial opportunities, manufacturing companies have increasingly extended their service offerings, mainly, because of the substantial potential revenue and attractive profit margins.

With this business strategy, manufacturing companies have realized, that services are a more stable source of revenue, if compared with from manufactured products, giving as a result considerable financial benefits from an extended service offering. Furthermore, there is an argument that competitive services enable companies to differentiate their total offering, which serves as competitive advantage. Due to such characteristics, manufacturers consider service business more difficult to imitate in comparison with products (Gebauer 2010 15:3)

Furthermore, strategic service business opportunities are closely related to financial benefits, this effect, can be perceived by extending the service offerings which, as an effect, market becomes more opened in terms of alternative solutions making more difficult to compare different supplier offerings, leading to less direct competition in price and improved profitability (Malleret 2006). A developed and structured service business can also help as a strategy for retaining current customers and attracting new potential ones (Homburg et al. 2003).

Diverse categorizations have been mentioned by authors, Mathieu (2001) categorizes the service approaches of manufacturers into customer service, product services, and service as products. The described categorizations are described as followed. First, *Customer service*: facilitates a company's customer relationship and loyalty at a general level. Second, *Product services*: facilitate the sale of a product, which is sold by the company, and support product operation. Third, *Services as products*: are independent of the company's tangible offerings and can be purchased separately from other transactions. Furthermore, Kotler (1994) differentiates according to repair, main-

tenance and business consulting services. Customers demand repair and maintenance services while operating the product, whereas business consulting is relatively independent from product operations. The next section, the concepts of Maintenance and Repair business are described.

3.1.1 Concept of Maintenance Business

Very often parts of industrial machines are broken or damaged, although the machines are still functioning. A technical failure can involve more than one component and more than one kind of component. A decision maker has to find a strategy that defines replacement policies of these obsolete pieces of equipment. Most of the time, the strategy is to replace gradually the old component in a corrective way, progressively with their normal outage, but at the risk of a larger number of failures. (Zhang et al 2001; Leung 2006)

Due to increasing failure rates and increasing repair times, an equipment might become economically non repairable after presenting certain amount of technical failures, until this point a decision needs to be considered, whether to continue repairing the equipment and face the increasing cost or replace the equipment completely (Nodem, Garbi and Kenné 2011: 3544)

As described, it is necessary to consider keeping repairs or complete replacement in order to keep equipment in operational conditions, furthermore, for such approaches, the concept of maintenance is considered as a problem solving alternative, however, maintenance has traditionally been viewed as a cost center, under, such a perception, maintenance is often regarded as an expense account, a popular target for cost reduction programs (Tsang, 1998). However, in nowadays industry, its perception is increasing at the direction of being a holistic approach which in a long term can provide real rewards. (Neil 2002)

On the other hand, in today's increasingly competitive marketplace, there are few businesses that are not being continually challenged to increase production and lower costs whilst continuing to meet ever-changing and stringent health, safety and environmental targets, the mentioned concepts have become a "must", since regulations and quality systems have been required to be accomplished as a customer or governmental demand.

Aligned to this is the fact that maintenance, as previously mentioned, is often viewed purely as a cost generator, or a necessary evil, rather than as a means of strategically delivering long term, sustainable business improvement. However, it is now becoming increasingly evident that in many business organizations big amounts of money are sacrificed every year due to this lack of awareness of the relationship between maintenance and business performance. Such lack of awareness drives to losses for any organization. However, Neil argues (2002) that an efficient maintenance can make a considerable difference between good asset performance and great asset performance.

Hilligoss (1992) argues that another misconception of maintenance is that it has a major impact on the product quality, cost and delivery objectives. It is also one of the most difficult budgets to be corrected because it is rooted in traditionally accepted ideas in financial and accounting procedures and practices.

Wang (2002) compared and classified maintenance models in order to define decisions which might help to solve current technical failures. According to that classification, maintenance can be categorized in two major areas. First, *Corrective maintenance* which is executed at the moment the equipment has failed. This type of maintenance is also known as breakdown. It is a failure based breakdown or an unplanned maintenance. It is the simplest type of classical maintenance policies where an item is used until it breaks/faults with the only activity centering on repair and servicing of the parts. Corrective maintenance can then be subdivided according to whether it is done immediately or deferred to a later date, and perhaps included in a longer run maintenance plan.

The other type of maintenance is *Preventive maintenance*. Preventive maintenance occurs during the time when the equipment is in operation, and it also refers to cases where repairs and/or replacement take place without the occurrence of any specific fault. As the name indicates, the plan is to prevent failures. In many preventive maintenance models, the system is assumed to be as good as new after each maintenance whereas a more realistic situation is one in which the failure pattern of a preventively maintained system changes to somewhere between as good as new and as bad as old (Ben-Daya and Duffuaa 1995).

It is mentioned by some authors that the preventive maintenance effects can also be subdivided into a *perfect*, *non-effect* and *imperfect* effect, where *the perfect effect* has

as implication to restore the system to good-as-new; a non-perfect effect has as implication to bad-as-old, and an imperfect effect serves as partly good.

Based on the mentioned concepts, Nodem, Garbi and Kenné (2011) have included into this classification the concept of *Complete replacement*. Complete replacement can be considered as a perfect maintenance solution since, in the manufacturing environment, preventive and corrective maintenance, including replacement activities, often occur simultaneously.

Furthermore, considering the concept of maintenance-focused service business, agreements are an important key when deciding the type of maintenance to be considered. A *service agreement* provides maintenance and priority service, but also covers the repairs up to a certain monetary amount. Some authors rate the advantages of signing maintenance agreements over those of service plans. However, whatever the type, some version of a customer agreement is necessary since many companies institute a maintenance program. However, quite often but due to poor follow up, the lack of coordination and communication, those aspects that can drive the company to the point of doing good business and get the customer on an agreement, those efforts can be ruined due to poorly organized follow up services. (Lombardi 2007: 31).

3.1.2 Concept of Repairs Business

As described in the previous sections, in order to keep an equipment running and reduce the failure rate and subsequent repair times, there is an incentive to perform preventive maintenance on the equipment before the failure can occur. However, when the failure occurs and the equipment can be repaired or replaced by a new one, this decision can be considered depending on the equipment's age as well as the rate of failure within the scheduled preventive maintenance

The concept of Maintenance and repairs (M&R) are related to each other. Cotts (1993) argues that M&R approaches should be based on the followed concepts: 1) Properly funded M&R preserves facilities management's capital investments. 2) Properly funded M&R permits employees to work safely and productively. 3) Company employees need to feel connected and responsible for good M&R. 4) Facilities should be designed for maintainability. 5) For every company business plan, there should be a corresponding

facilities plan, and a significant portion of it should be devoted to maintenance. 6) There is a cost of ownership. (Cotts 1993)

In order to reach the coordination of the described concepts, the key to a successful M&R program is establishing a Service Reception Center (SRC) which would coordinate all the work of the facilities department. For this center to function properly, the staff must be given authority to task shops directly to accomplish all but exceptional work and must have explicit guidance in what work is an exception. Budgeting of such a center is also a critical function. (Cotts 1993) Furthermore, the criticality of repair services relies on service provider's responsiveness after the customer enters a request for an urgent repair. At the end, the total amount of time between the equipment's failure to its repair is a crucial determinant of responsiveness by the service provider (Peterson, Gregory and Munch 2005: 356)

As discussed in the previous section, any offer of service needs to be agreed. In the case of repairs, full-service repair contracts are becoming increasingly popular, especially as an add-on to leasing contracts for technical investment product due to the fact that unexpected repairs which can be devastating to a department's budget.

The price of most of the service contracts is, however, based on the worst-case scenarios, such as the situation of high-cost, complex and frequent repairs. This price is not based on equipment performance or the actual cost of the service. When a report detailing the actual cost of service is requested, it typically shows the service provider losing money. In an attempt to justify the cost of the service contract, every possible service call is listed, charged (instead of the exchange price) and reported, many of which would not be billed for under a time-and-material contract. Under a service contract, only the service company knows the true state of the organization's maintenance costs.

3.1.3 Repair Projects as Service Business Concept

Repairs are necessary in order to keep equipment in operational condition. However, in some cases, the repair might require a planning process due to the complexity in providing components. For such cases, as practice suggests, any efforts should be considered as a project, especially when it comes to running big or major repairs.

According to the APM (Association of Project Management), a project describes the activities that meet specific objectives and can be used to introduce or improve new or existing products and services. A project identifies two key features: *a) Uniqueness*, which means that projects are separate from business-as-usual activities, due to the fact that they require people to come together temporarily to focus on specific project objectives. As a result, effective teamwork is central to successful projects. *b) Transience*, which mean that a project has a specific start and end point and is set up to meet specific objectives, to create a specified result, product or service.

Projects need to be controlled to meet their objectives and deliver benefits. Objectives are defined in terms of expectations of time, cost and quality. Such objectives are shown in Figure 3.

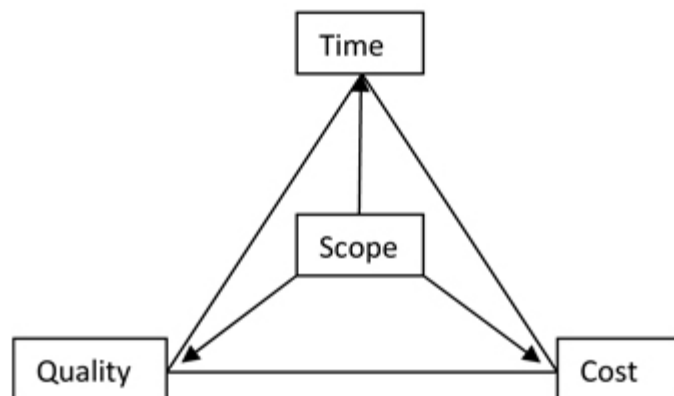


Figure 3 Project objectives (according to the Association of Project Management).

Objectives, similar to those illustrated in Figure 3, can be identified also for major repairs projects.

3.2 Sourcing Concept

The sourcing concept first appeared in text books in the early 1960's referring to the activities which are more than just a strategy for finding a source for products and services.

3.2.1 Sourcing in Service Business

Changes in global markets have made sourcing essential for organizations and the current business environment; and sourcing often becomes a target to redesign the process of procurement and the logistic of delivering materials to final customers to gain business and cost benefits.

Sourcing activities can be involved in a wide range of business processes. Sourcing activities are involved in the operation buying, supplier commitment and development, as well as the creation of global purchasing actions. Furthermore, strategic sourcing is defined as a strategy focused consciously and selectively on applying business skills and relationship management on procurement areas that optimize the results and benefit the business. At the end, sourcing can be described as a way of conducting business that supports the company's strategy.

Lyson and Farrington (2006) argue that sourcing has a direct influence within the overall operation of the company in terms of profitability, supply risk, high risk of products and services, focusing on value creation. On the other hand, Kotabe and Murray (2004) refer to global sourcing as a process where inward, outward and cooperative operations are linked in the dynamics of international trade.

In service business, sourcing activities are focused on determining the supply chain process for the availability of spare parts by establishing contract coverage with strategically suppliers. The result of sourcing activities support company's strategy based on an established network of market products, service providers and solutions, leading to a consistent portfolio of commercial agreements and strategically partnerships. In addition, it is targeting the cost saving programs in order to increase price competitiveness of offered prices.

3.2.2 Sourcing in the Spare Parts for Service Business

According to Baily, Farmer and Jones (2005), relationships between the firm and its supplier are important part of global sourcing operation. In the concept of service business, the availability of spare parts is critical, selecting or having strategically suppliers who are able to provide spare parts, is a key factor to be considered when selecting a supplier for service business. The next characteristics required are: 1) The supplier

should have a high understanding of spare part markets. 2) It is necessary to identify differences and variances parts criticality, in addition to showing adaptability to unexpected changes and knowledge of forecasting and demanding processes. 3) The need of determine and establish delivery times and its availability to offer complexity in portfolio management. (Baily, Farmer and Jones 2005).

On the other hand, another characteristic is the skill to build supplier-buyer relationships and global locations.

Within the service repair concept, supplier's performance is one of the most important development areas for spare parts. The improvement parameters for suppliers, in spares business, should be focused on three aspects. First, *Supplier quality* is considered as a measurement of supplier performance in terms of increasing quality in products and monitoring the delivery on time of the products. Second, *strategic sourcing* is a process for reducing the total cost of purchased materials, goods, and services while maintaining and/or improving levels of operational efficiency, quality, technical innovation, customer service, and system safety (Batson 2008: 668) Finally, *Operative purchasing*, which according to Batson (2008: 668), is purchasing as a "process by which a company contracts with third parties to obtain goods and services required to fulfill its business objectives in the most timely and cost-effective manner".

3.3 Business Model Conceptual Framework

Section 3. 3 presents the conceptual framework for business model and discusses its features and interaction with other business areas. The researcher will be focusing on the most important aspects to be considered to create a better vision of the conceptual framework which will later be applied for the development of the process model.

3.3.1 Business Model Concept

The literature reveals that there are several definitions for the concept of business model. According to Osterwalder (2004), the term *business model* intuitively has something to do with business and something to do with models. However, according to the Cambridge Learner's dictionary (2003), the next definitions can be described for the terms. For business: *the activity of buying and selling goods and services, or a particular company that does this or work one does to earn money*. Model is defined as: *a representation of something, either as a physical object which is usually smaller than*

the real object, or a simple description of the object which might be used in calculations.

The term "business model" was first used in the context of data and process modeling and it became the established expression among those working in the emerging new technologies sector at the end of the 1990s, before extending exponentially to managerial and academic spheres (Moingeon-Ortega 2010: 206). For example, Casadesus-Masanel (2011) argues that a good business model should meet three fundamental characteristics: a) Business model should be aligned with company's goals: a business model should deliver consequences that enable an organization to achieve its goals; b) it should self-reinforce : the business model elements should complement each other and by being robust, c) should be robust: by fending off threats like imitation, hold up, slack and substitution.

On the other hand, Chesbrough (2006) argues that the development of a new business model represents the most challenging task for a management team, since a new business model defines the overall business logic of a company at the strategic level. Furthermore, Johnson (2010) believes that business models can reshape industries and drive to spectacular growth. Following the literature, several authors describe a business model. According to the focus on the case company, the researcher has noted that, some authors, base their definition of the concept on three approaches described as followed.

The first approach focus on *appropriation value of the firm*. This approach is presented by such figures as Chesbrough and Rosenbloom (2002) who refer to this approach by focusing on the operational aspects of the business model based on a financial dimension. In their analysis, a business model should contain the followed aspects, a) to articulate the value proposition and its relation to intended market segment, b) to define the value chain of the firm require to create and distribute the offering outlined in value proposition, c) to determine the complementary assets needed to create the offering and support its position in the value chain, d) to position the firm within the value network context, including the identification of potential complementors and competitors, e) to estimate the cost structure and profit potential associating the business model concept to value creation and formulate the means whereby a firm will gain and hold an advantage over its rivals linking the business model concept to strategy .

The second approach place its focus on *the value generated* through a company's operational methods with or without explicit reference to its supply chain. Yip (2004) in his analysis defines that a business model should consists of the next aspects : *value proposition, nature of inputs, how to transform inputs (including technology), nature of outputs, vertical scope, horizontal scope, geographic scope, nature of customers*. Timmers (1998) defines a business model as an *architecture for the product, service and information flows, including a description of the various business actors and their roles*; and a description of the potential benefits for the various business actors; and a description of the sources of revenues.

The third approach includes *the clients and products* in their business models. This approach is represented by such figures as Rajala & Westerlund (2007) who refer to business models by *including customers and products as a the way of creating value for customers, and to the way a business turns market opportunities into profit through sets of actors, activities and collaboration*.

Furthermore, Osterwalder (2010:14) argued that a business model *describes the rationale of how an organization creates, delivers and capture value*. However, the challenge is that the concept must be simple, relevant and intuitively understandable allowing to easily describe and manipulate business models to create new strategic alternatives.

According to this definition, Osterwalder (2010) argues that a business model includes a process to be developed. This process is described in Figure 4.

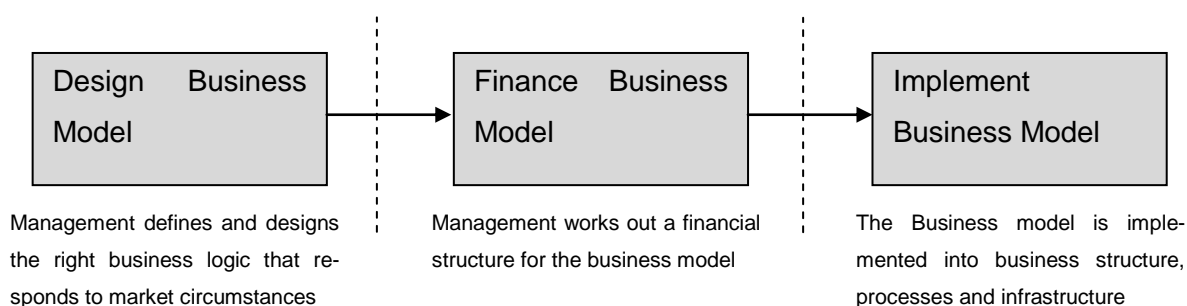


Figure 4. Business model steps (Modified from Osterwalder 2004)

According to Figure 4, the business model design translate a strategy into a business model bluepoint. Then, the business model has to be financed by trought external or

internal funding and finally has to be implemented into an actual business enterprise. (Osterwalder, 2004:15)

There are several definitions of the business model concept as authors, however, in this Thesis the most relevant were considered to be described in order to have a better understanding for the reader in order to be used when considering which business model should be selected.

3.3.2 Components of a Business Model

The business literature suggests several structures or elements of a business model, in order to present to the reader a better understanding of the concept, several authors are analyzed in order to define and select the business model structure to be used in this Thesis. Osterwalder (2010), mentioned that the interest in implement or reinvent a business model has become imperative in order to keep competitiveness and profitability, furthermore, in his approach, it has been defined that a business model can be described through nine basic building blocks or canvas that can show the logic how a company intends to make money, furthermore, the nine blocks cover the four main areas of a business: customers, offer, infrastructure and financial availability.

The blocks are described as followed, a) customer segments, b) Value proposition, c) Channels, d) Customer relationships, e) revenue Streams, f) key resources, g) key activities, h) key partnership, i) cost structure.

The building blocks are described as a canvas, are represented in Figure 5.

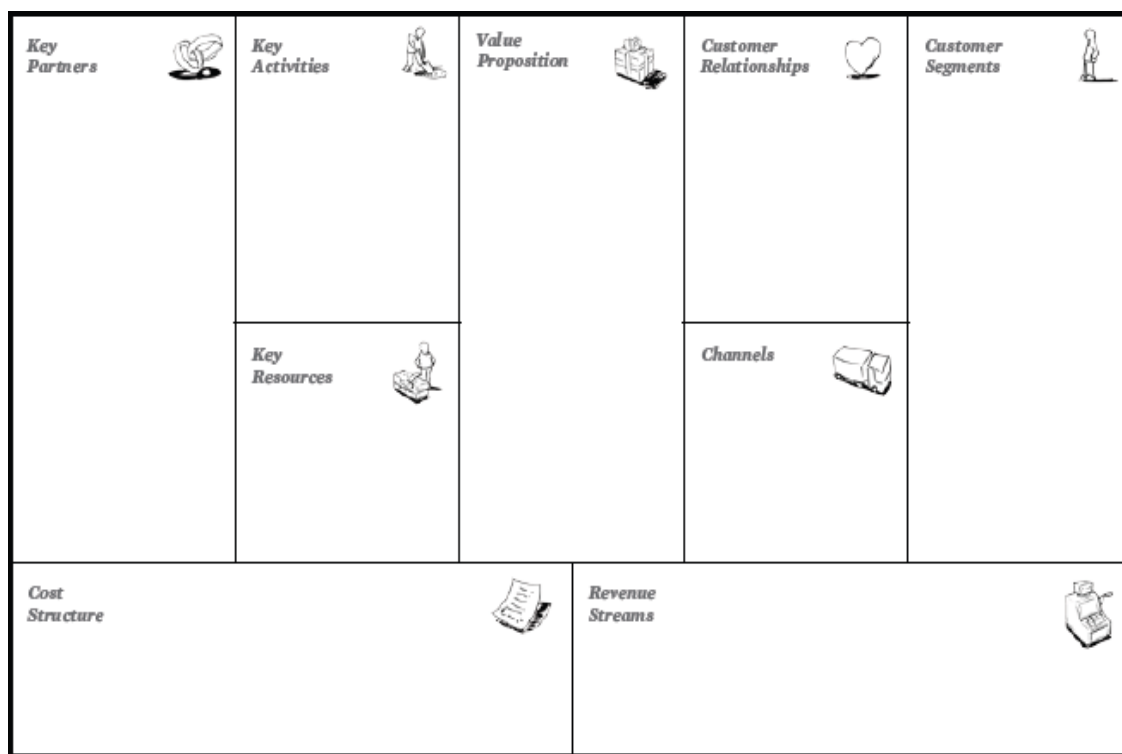


Figure 5. Business Model canvas (Osterwalder 2010: 44).

Figure 5 presents the canvas, represent a business model and the logic of how a company intends to make money, however, business models might share similar characteristics, arrangements or behaviors.

For example, Johnson (2010) suggest another approach based in, that a business model should consist of four interlocking elements that taken together create and deliver value, such elements are: a) Customer Value Proposition (CVP), b) Profit Formula, c) Key resources, d) Key Processes, and in order to complement the business model analysis, relevant information from other authors, such as Osterwalder's canvas is considered .

Based on Johnson and Osterwalder, the elements that make a business model successful and its interactions are considered for the business model framework, as shown in Figure 6 below.

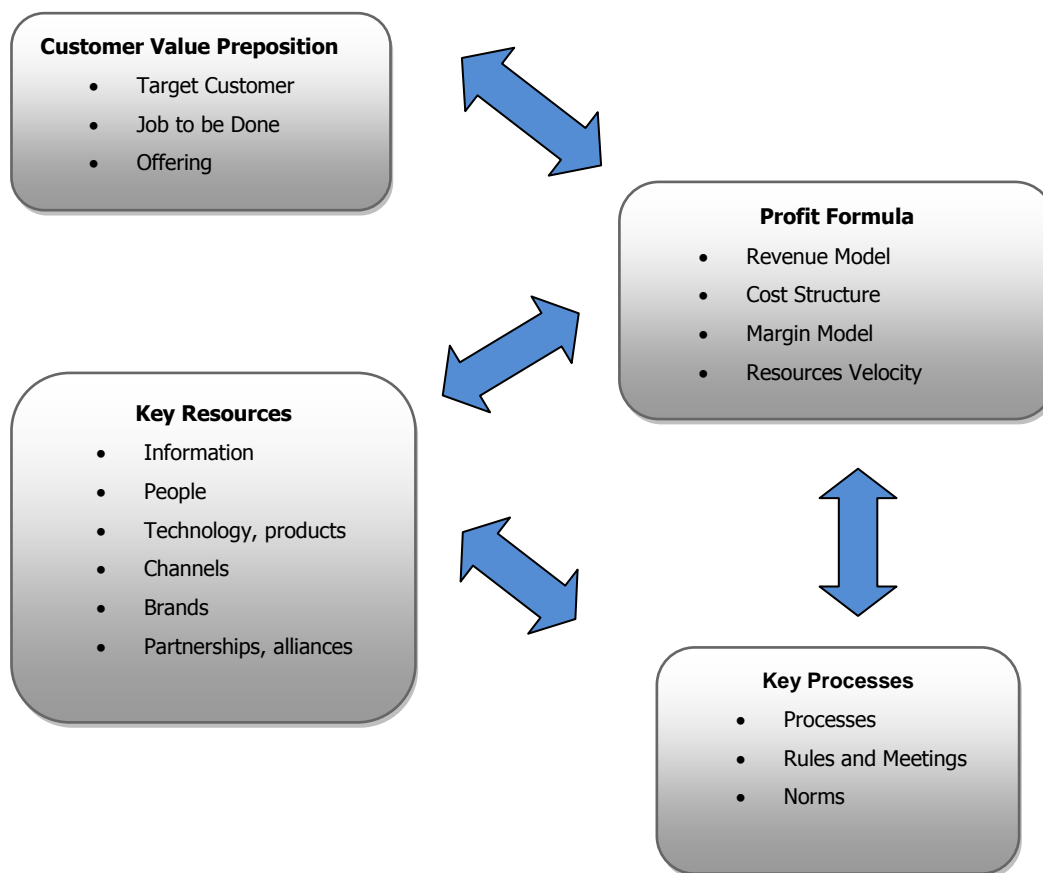


Figure 6. Business model framework (based on: Johnson 2010: 5).

The elements of the business model framework and its interactions are described as follows:

Customer Value Proposition

According to Johnson (2010), it is not possible to invent or reinvent a business model without first identifying a clear customer value. However, a successful company is one that has created value for its customer by helping them to perform and solve a specific problem in order to get the job done. Furthermore, the offering of customer value proposition is defined not only for what is sold but also for how it is sold, since an elementary offering describes a specific product, service or even product or service feature and outline its assumed value to the customer.

However, Osterwalder (2010), has defined value proposition as the reason why customers turn to one company over another since it solves a customer problem or satisfies a customer need, furthermore, value proposition creates value for a customer segment, through a distinct mix of elements catering to that segment needs, in addition, it is necessary to consider basic elements that can contribute to customer value creation : a) Newness b) performance, c) customization, d) getting the job done, e) design, f) Price, g) brand/status, h) price, i) cost reduction, j) risk reduction, k) accessibility, l) convenience/usability.

Newness satisfies an entirely new set of needs that customers previously did not perceive. *Performance* improves a product or a service. *Customization* allows to standardized products and services. *Getting the job done* by helping the customer get certain jobs done. *Design* describes a product might be out of market scope due to superior design capabilities. *Brand/ Status* describes that customers may find value by using and displaying a specific brand. *Price* by offering similar value at a lower price. *Cost reduction* describes that by reducing cost value is created. *Risk reduction* describes customers value reducing the risks they incur when purchasing products or services. *Accessibility* by making products and services available to customers. *Convenience/usability* by making things more convenient or easier to use.

Profit Formula

Johnson (2010) argued that profit formula defines how the company creates value for itself while providing value to the customer; in addition, profit formula consist of the four elements. First, the *Revenue model describes*, how much a firm can make since the revenue is calculated trough the formula $\text{Price} \times \text{volume} = \text{revenue}$, on the other hand, when considering revenues, Osterwalder (2010) considers, that a firm should ask to itself, for what value are our customers really willing to pay. Second, the Cost Structure which states that creating and delivering value, maintaining customer relationships and generating revenues all incur a cost. On the other hand, a cost should be minimized in every business model. Additionally, within cost structure, it is important to define and identify what a cost is. Furthermore and due to the extent of the context, cost can be classified in a major characteristic in fixed and variable costs. Third, the Margin Model which after considering the volumes and cost structure, describes the contribution

needed from each transaction to achieve the desired profits; and fourth, the resource velocity which describes how quickly the resources need to be used to support target volumes or how well companies need to utilize the available resources.

As described before, the previous elements on profit formula, determine how profitable a company can be when targeting profits, identifying and controlling the incurred cost elements.

Key Resources

In order to create value, a firm needs resources, Osterwalder (2010) describes that key resources allow an enterprise to create and offer value proposition, reach markets, maintain relationships with customer segments and earn revenues.

Other definition for key resources can be as a current firm's assets, such as people, technology, facilities and equipment which is required to deliver value proposition to customers (Johnson, 2010: 4), furthermore, the focus in determining the key elements is to create value for the customer and the firm, and the way those elements interact each others.

Key resources can be categorized as a) physical, b) intellectual, c) human, d) financial. The described categories can be considered as the most important assets required to make a business model work.

Key Processes

Key processes or activities are the most important actions a company must take to operate successfully, such activities are required to create and offer value proposition, reach markets, maintain customer relationship and earn revenues (Osterwalder 2010: 37). In addition, Johnson (2010) has argued that successful companies have operational and managerial processes that allow them to deliver value in a way they can repeat and increase in scale. Such statement relies on the fact that processes should measure by establishing rules, metrics and norms which can be used to deliver process performance

However and according to the reviewed literature, comparison among diverse authors is challenging because the same concepts can be described in different way or the use of diverse elements can drive to the same concept definition. However, in order to find the most complete and suitable business model for this Thesis, the suggested frameworks described by Johnson (2010) and Osterwalder can cover the most important aspects for a business model. Therefore, the required model will be developed based on these service business literature and the results of the case company analysis.

3.3.3 Business Model in Strategy

Osterwalder (2004) argues that strategy and business model talk about similar issues but in a different business layer. In other words, the vision of the company and its strategy is translated into value propositions, customer relations and value networks. This relation between strategy and business model is illustrated in Figure 7 below.

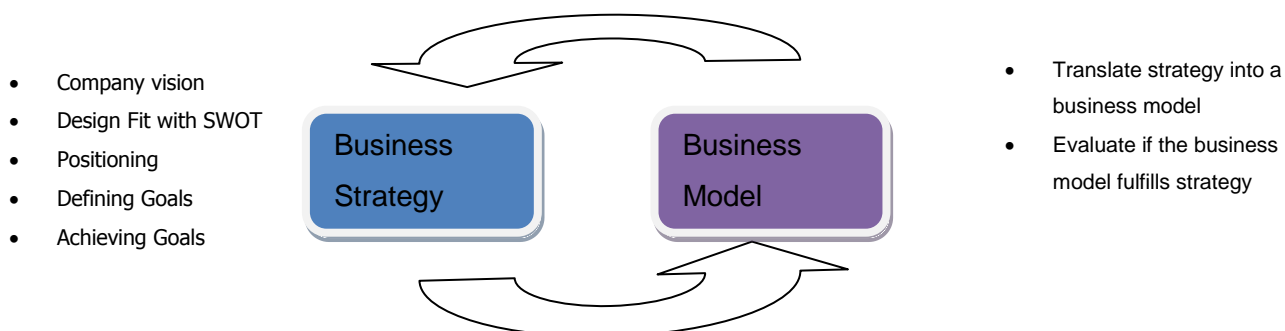


Figure 7. Interaction between business strategy and business model (Osterwalder 2004).

Figure 7 describes the interaction between business strategy and business model where company's vision, positioning, designing fit of strength and weakness and defining and achieving its goals. They are all components of the business strategy, which when interacting, translate strategy into a business model and evaluate if business model can fulfill strategy.

3.3.4 Disruption in Business Models

As described, a business can reshape industries and drive spectacular growth. Thus, it is important that the established business model in a firm needs to be understood accordingly to the four components described in the previous section. However, companies might find business model difficult (Johnson 2010: 1) since it is subjected to continuous and incremental changes. The disruption occurs as result of technological progress or even when identifying new business segments since there might be times when creating a new growth requires venturing into unknown market territories, but also new business model territories.

In order to have an understanding in identifying when a new business model might be required, Johnson (2010) describes five circumstances that require business model change: 1) the opportunity to address through disruptive innovation the needs of large groups of potential customers who are shut out of a market because existing solutions are too expensive for customers, 2) to capitalize on a brand new technology by wrapping a new business model around, 3) to bring a job to be done focus where does not exist, 4) the need to fend off low-end disrupters, 5) the need to response to a shifting basis of competition. (Johnson 2010)

3.4 Conceptual Framework for This Study

Since the main target for KONE service and repair business is to keep the equipment in operational conditions, in this Thesis, the analysis of service business has looked for the opportunities to build a business model to address these goals. This business model aims at providing opportunities by not only delivering spare parts, but also entire solutions to the customers to increase KONE GSS service performance and revenues. The suggestion for developing a business model relies on the opportunity to improve availability of the spare parts for repairable escalators. This business model is developed according to the core competencies of the organization, coupled with other suggestions from the literature review about the importance of key resources in the organization in order to create and retain a sustainable competitive advantage.

The business model concept of this Thesis is based on the other available business models and service literature. Furthermore, it considers possible sourcing activities and disruptions when looking for a possible solution. The proposed business model is visu-

alized, for KONE GSS, based on the approach by Johnson (2010) who defines that a successful business model as consisting of four interlinked elements: a) customer value proposition, b) profit formula, c) key resources and d) key processes. Additionally, the proposed framework is also rooted in the elements described by Osterwalder (2010) in his business model canvas. This combined approach shapes the model to fit the case company needs and build a proposal.

The elements considered for the proposal of a business model and the framework for this Thesis are described in Figure 8 below.

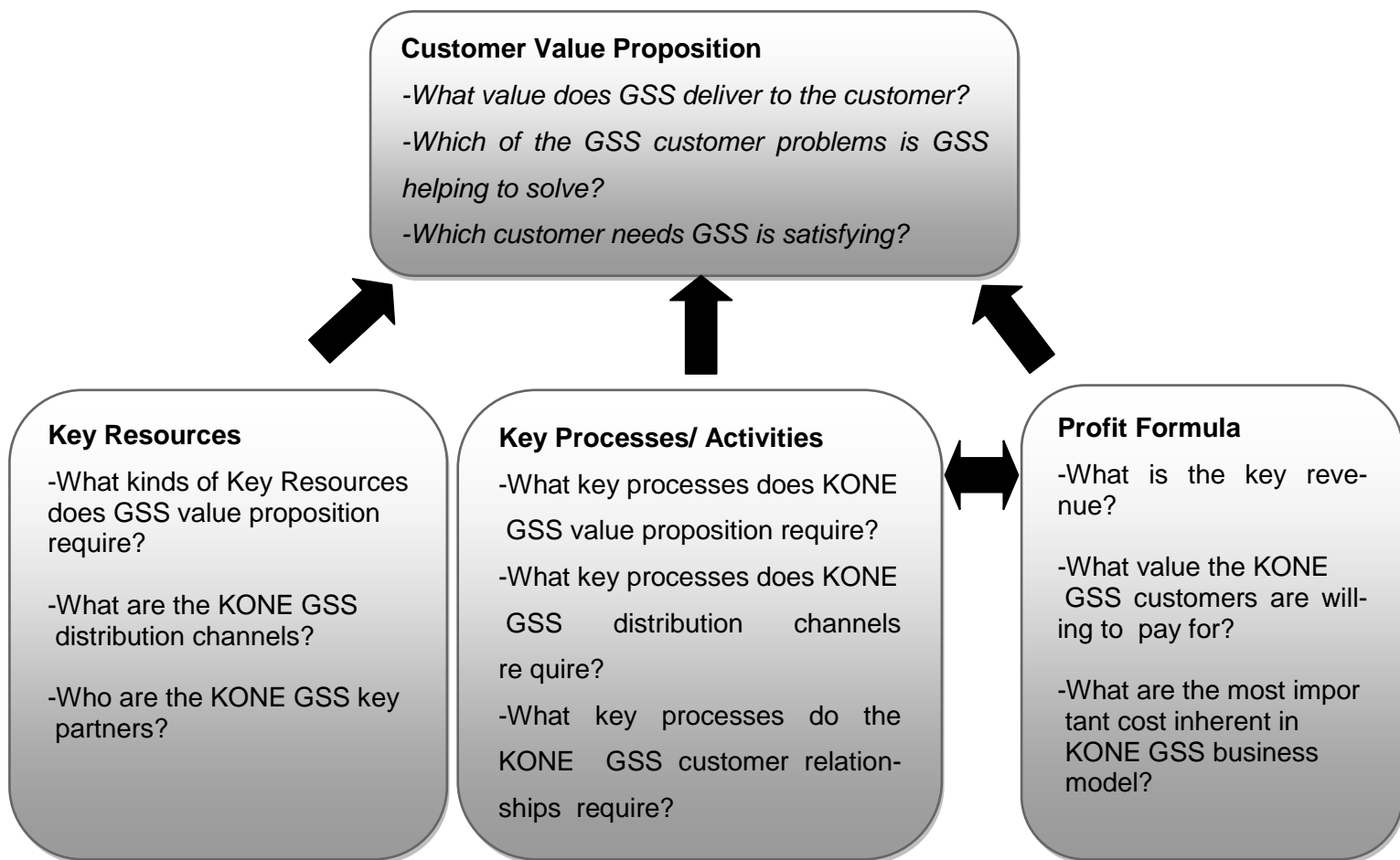


Figure 8. Business model Framework and considered elements for this Thesis

Figure 8 described the proposed framework for this Thesis based on the literature from Johnson and elements from Osterwalder. The suggested business model provides visualizes the opportunity to satisfy customers by having spare parts available and providing solutions in order to get the job done.

The selected four elements can be used as a proposal for building a business model the implications for each element it are described.

Customer Value proposition in KONE GSS intends to define the added value, the solutions and the needs that KONE GSS can provide. It is suggested in order to be selected by KONE frontlines as a supplier of spare parts and as solution provider instead of looking for alternative solutions out of KONE organization boundaries. The suggested value proposition requires resources in order to make the business model work. The required resources in KONE GSS need to be defined in order to reach markets, maintain relationships with customer segments and earn revenues (Osterwalder 2010: 34). Furthermore, resources require distribution channels to communicate, deliver and evaluate the offered value proposition by KONE GSS. However, the development and assignment of key partners are becoming the cornerstone of the business model by creating alliances to optimize business models, reduce risk or acquire resources (Osterwalder 2010:38).

Because of importance of the revenues in the implementation of the business model, *Profit Formula* is suggested to define the key revenue in the business model. In addition to define the value KONE GSS customers are willing to pay, furthermore, cost analysis is considered.

Key Processes are the activities that describe the most important things a company must do to make its business model work. Furthermore, those are required to create and offer value proposition, reach markets, maintain customer relationships and earn revenues (Osterwalder 2010: 37). The framework for this Thesis suggests defining the processes that KONE GSS value proposition, distribution and customer relationship requires

The analysis of the suggested elements of the framework applied to the case company and its interaction within the business case of KONE GSS is presented in Section 5 below.

4 Current State Analysis

This section describes the current state of the escalator service business in KONE organization and its implications for the spare parts business. This section also overviews the current ordering process and discusses the limitations imposed by the current process on availability of the spare parts for major repairs.

4.1 Escalator Service Business in KONE

KONE is one of the largest elevator and escalator companies in the world. Established in 1910, KONE provides its customers with innovative solutions for maintenance and equipment modernization in escalators and automatic building doors industry. KONE's vision is to deliver a cutting-edge performance to customers by creating the best user experience with innovative *People Flow* solutions. Simultaneously, KONE aims at enabling operational excellence and cost competitiveness in its product and services, as well as excellence in people leadership and processes. (<http://www.kone.com>)

KONE Corporation

KONE Corporation is headquartered in Espoo, Finland; and, since the company was founded in 1910, KONE has developed into a global player in the elevator industry. In 2012, KONE had the annual net sales of EUR 6.3 billion and approximately 40.000 employees worldwide. KONE operates through more than 1.000 offices around the world and have eight global production units located in key markets, such as Europe, Asia, Middle East and the Americas. In addition, KONE has authorized distributors in over 60 countries. Presently, KONE is rated in class B and listed on the NASDAQ OMX Helsinki Ltd.

KONE key customers are builders, building owners, facility managers, and developers, as well as architects, authorities, and consultants who play a key role in the decision making process for elevators and escalators. The majority of KONE's customers are, however, maintenance customers which range from small facility management companies serving a single building to large global retail or hotel chains. (KONE in brief document 2012)

The work labor of the company is distributed in a similar way, with the maintenance staff leading among the other KONE specialist. The structure of the KONE labour force of illustrated in Figure 9 below.

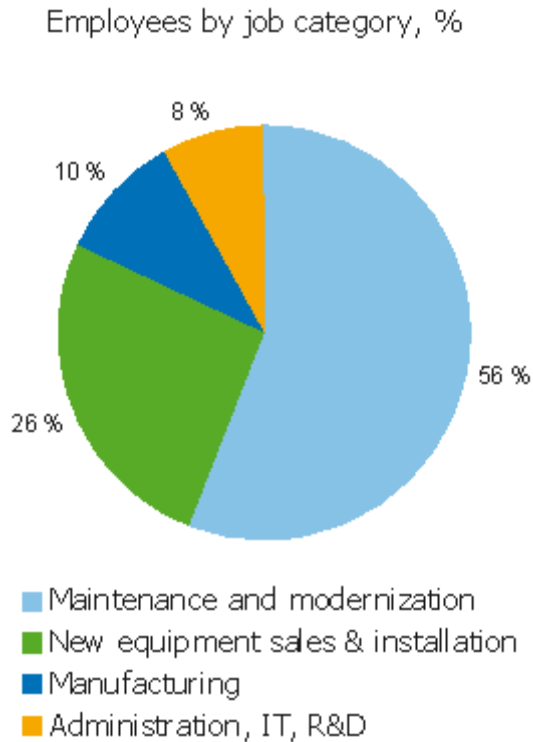


Figure 9. Structure of KONE employees by category, worldwide (KONE 2012 report).

Figure 9 describes the current structure of workforce in KONE, with 59% of KONE labor used for modernization and maintenance business. The new equipment stays on the second place, with 23 % of the company personnel employed there. Manufacturing represents 10 %; and IT, R&D and administration employing 8 % of the workforce in 2012.

Since 2012 has been a challenging year due to global economic environment and overall uncertainty situation, the new equipment demand has weakened considerably in many markets outside Asia-Pacific area. Furthermore, price competition intensified, especially in new equipment and service segment. As a result, in new equipment in Europe, Middle East and Africa region (EMEA), the market declined quite significantly. The markets showed slightly less decrease in Central and Northern Europe, mostly staying on a pretty good level there. In South Europe, the market declined more obviously to the weaker level. In the Americas, the recovery from a low level continued in 2012.

Finally, in the Asian-Pacific countries, the markets for new equipment continued to grow but at a lower rate in comparison with 2011. (KONE's board of director's report 2012)

Thus, KONE'S operating environment has been challenging during 2012. In order to present a graphic of KONE's performance, Figure 10 displays how the service business is currently doing. Figure 10 presents two key areas on which KONE is focusing its efforts (services and the new equipment) in three global markets (EMEA, Americas and Asia-Pacific).

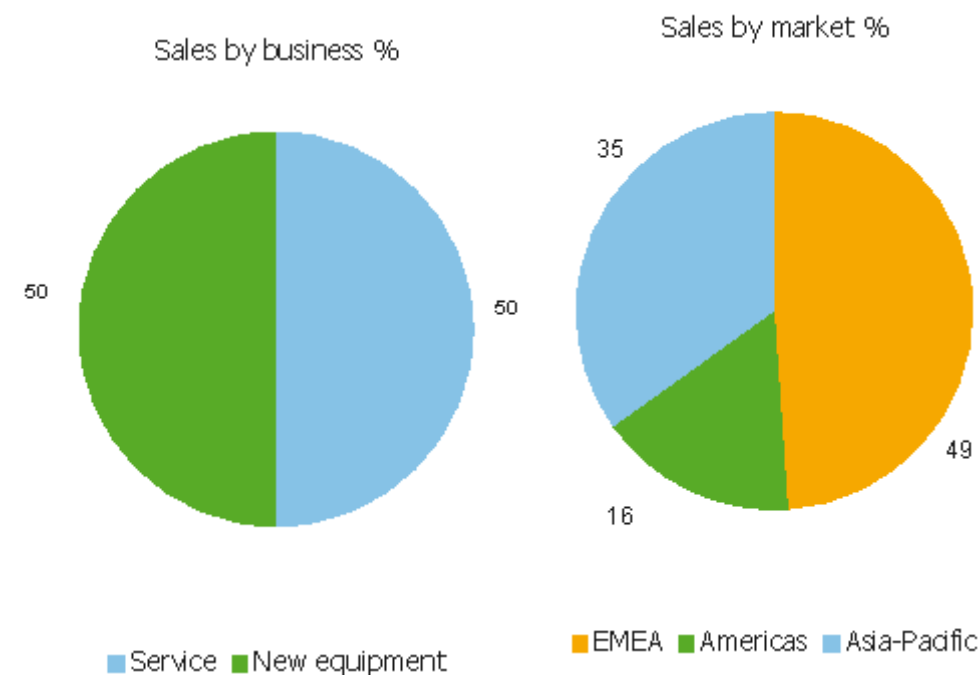


Figure 10. KONE sales % according to the market offering segment and market location (KONE 2012 report).

Figure 10 illustrates the trend for the service equipment and new equipment business in 2012. Both segments made about the same share of 50% during 2012. In addition, the distribution of the sales shows the prevalence of EMEA region in the KONE operations, according to the geographical location. Since introducing escalator solutions to the KONE portfolio in the 1950's, KONE's strategy was to increase its presence in the international markets, as well as to gain an increasing niche in the maintenance sector. Figure 10 illustrates the current state of KONE presence in these targeted sectors.

The global escalator and autowalk global markets grew from appx. 55.000 units in

2011 to appx. 60.000 units in 2012. If the current rate continues, the production and use of escalators worldwide will be growing by around 5 % every year. Furthermore, KONE has reported that, in service and maintenance contracts, there were more than 800.000 elevator and escalators, with the estimated more than 2,2 million of breakdowns occurring during a year. Thus, the amount of breakdowns defines the importance of supporting, developing and improving activities for service and maintenance business in order to keep the equipment in operational conditions and keep customers loyal.

Global Spares Supply (GSS)

The unit of this study is KONE Global Spares Supply (KONE GSS). Within KONE Service Equipment Business organization, KONE GSS is responsible for providing all kinds of spare components, of both KONE and competitor design, for maintenance and modernization projects.

As described in the previous section, almost 50% of KONE net sales during 2012 came from the portfolio of maintenance and modernization services, which have become the key business areas for KONE. Presently, KONE modernization solutions range from small upgrades to the full replacement of the elevators, escalators and doors. Furthermore, KONE offers maintenance and monitoring solutions that maximize reliability and safety while minimizing downtime and costs. For these business segments, KONE stocks a wide range of spare parts for elevators and escalators and can also supply parts for equipment from other manufacturers.

For KONE, spare parts are critical components for modernization and maintenance business, and keeping availability and offering some reasonable delivery times can make the difference in acquiring or losing a service contract. As a business strategy, KONE has established GSS (Global Spares Supply) in order to provide all required spare parts within for maintenance and modernization segments in an organized and efficient way.

GSS was established on January 2006. Before that, spare parts business used to be handled by every KONE unit. To improve its internal processes, KONE Corporation decided to relocate warehouses, stocks and logistic processes to one administrative entity, which became GSS. This strategy has proved to be effective since the ordering

or spare parts and its delivery has been mostly harmonized. Presently, KONE GSS provide quality spare parts for all KONE elevators, escalators and automatic building doors, as well as commercial replacement parts and components for a wide range of other manufacturers.

Benefits of GSS operations for KONE frontlines include maintaining and holding a competitive position on the market, improving customer loyalty and optimizing productivity. Benefits for the customer include the prevention of business interruption, downtime, cost minimization and increase in equipment longevity. KONE GSS was established to address the need to unify these operations, previously distributed across other KONE units, primarily in Europe. GSS consolidated the spare business by concentrating such segments in one global unit operated administratively from Finland, but with global distribution centers mostly in Germany (for European Markets), China and in Singapore (for Asia-Pacific markets). The business objectives of GSS include becoming the best service provider for elevators, escalators and building doors. Other objectives include continuous improvement and increase in the market share and service performance level for the complete spare supply chain.

Currently, KONE GSS delivers more than 600.000 outbound / lines a year and keeps an inventory stock level for 36 Million €. However, there are saving stock projects currently going on where the reduction of inventory levels is considered necessary. This is planned to be done by controlling the lot sizes within the limits of the established targets.

Since KONE GSS has been established in KONE organization, it has focused its mission on providing the right component at the right time with the right price to the respective KONE frontlines around the world. The “right price” goal has been a priority since service markets have become extremely competitive, and the price factor for components has influence decision making for service or maintenance contracts leading to longer negotiations with current and potential customers.

Furthermore, KONE GSS has set the goal of providing technical support and the most convenience solutions in terms of spare parts, and stressed the importance of activities for harmonizing and improving the current spare parts offerings. To complement this and better address the competition with other elevator manufacturers and service pro-

viders, for certain cases, KONE GSS also considers offering solutions from other manufacturers, in addition to having the components produced by KONE itself.

Sourcing Alternatives in KONE Global Spares Supply

According to Bailey, Farmer and Jones (2005), relationships between the firm and its supplier companies are an important part of global sourcing operations. These relationships become a competitive advantage of the firm as an ability to reach and built relationship and partnership with suppliers in order to improve the supply chain. Varis (2005) argues that a good and reliable supplier relationship is fundamental to the success or failure of global sourcing activities.

As previously mentioned, the availability of spare parts is a key element for service business; and in order to establish an effective supply chain, availability of spare parts, also through sourcing organizations, plays a key role in such relationships. Additionally, such a spare parts supply chain should be flexible and ready to adapt to unexpected changes, in case the assigned supplier might present delivery or manufacturing problems. Moreover, alternative sources, though they could present the inconvenience of having a non-competitive price level. But since availability of components is a key factor in service and maintenance industry, this kind of solutions should be considered to extend the range of available sourcing strategies.

These alternative sources, in their turn, should be capable to deliver components on terms and conditions established by KONE GSS (as well as KONE GSS have terms and condition for the original sources). Variances in components consumptions or suppliers' capability to respond to changes within the established supply chain process, should also be taken into accounts in such relationships. For spare business to have an efficient supply chain, it is therefore vital to have alternative suppliers who can respond to unexpected changes quickly. Currently, due to the current global scenario, it has become a necessity to have such sources in different locations, even for the same components.

In addition, by centralizing the purchasing process, such as currently being done by KONE GSS, the demand for components would become more stable, eliminating the order batching effect in the supply chain. Another measure to improve the current supply chain is to deal with the lead-time. If the tile-lead could decrease significantly, it

would offer significant competitiveness in the value proposal offered to customers. Another alternative is the full outsourcing, especially for services and installations.

Finally, logistic solution can be considered as important sourcing activities relies; and customers often negotiate and require for the logistic services. In the case of KONE GSS, the warehouse services have been outsourced in order to provide all logistics arrangements for the inbound, storing and shipping of components to KONE frontlines. Such strategy was implemented through the idea to eliminate and concentrate all storing services around Europe in only one big outsource operation, thus reaching significance savings in terms of operational costs.

4.2 Availability of Escalator Spare Parts from KONE Global Spares Supply (GSS)

As it was stressed in the previous section, spare parts are the key factor for the success of the service business. As a result, availability of the spare parts for maintenance and major repair projects has become the number one priority for KONE Global Spares Supply. The problem is that availability presents a number of challenges, starting from establishing the origin of the spare part up to having up to date technical information and an active status of its supplier.

Starting from the problem of establishing the origin of a spare part, KONE Global Spares Supply has more than 34.000 escalator spare parts in its current offering. But due to application alternatives and variations in configurations, only 16.157 items out of these 34.000 have an established source of origin. Moreover, even knowing the source of origin cannot ensure that this source might be able to manufacture the necessary component.

Presently, the spare parts and supplier database are maintained by GSS and visible in the KONE GSS catalogue. Some of the items in the catalogue, however, have an unknown source of origin from the beginning. Several factors have influenced the decision to include these materials in the current KONE GSS catalogue, even though this material was without a defined supplier.

Figure 11 describes the main reasons why some escalator materials in the KONE GSS catalogue and supplier data base may not have a defined supplier.

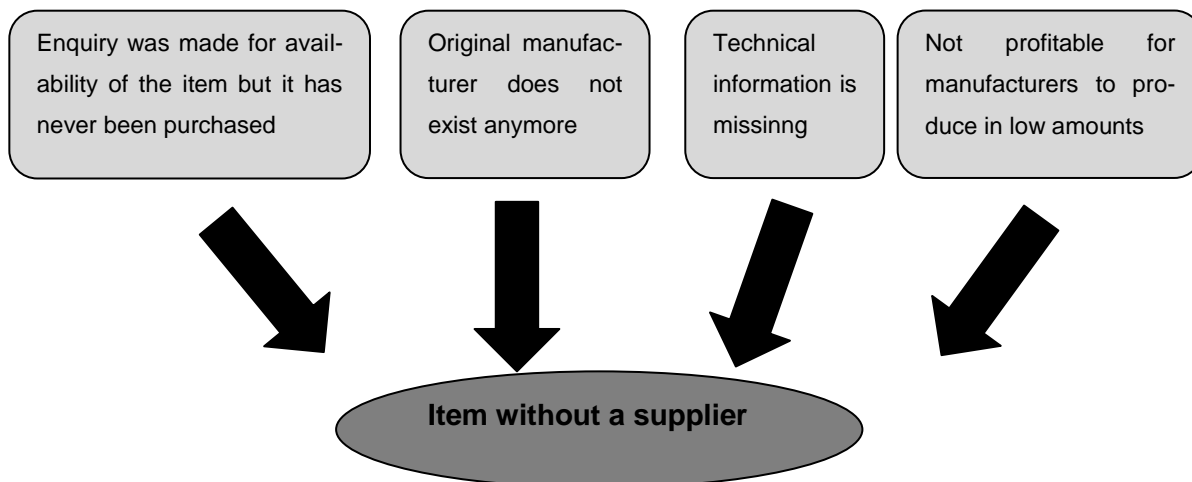


Figure 11. Reasons for not having a source of origin for some escalator items in KONE GSS catalogue.

Figure 11 shows the factors for which components might not have a defined source in the KONE GSS catalogue. In some cases, availability of the components from the original manufacturer could not be assured, as the next observation proves which was made when visiting a manufacturer:

*“The requested part is a very old module (20/25 years) and it's a discontinued product. There is a decision of the management to calculate and evaluate the material cost, labor costs, procurement costs, etc. each year”.
(Brainstorming session 3)*

As this example shows, further production of this particular item requires an investment in order to keep it available. Such an investment needs to be analyzed and its profitability calculated by the organization, before the decision to continue is made.

In the same line, another manufacturer has provided a similar explanation during the visit to his premises:

“We are unfortunately unable to continue production for those parts for the future. What we indeed can offer is a kind of "last buy" for those products which means we would buy the parts we need for production - according

your information now - and produce those parts within the next 2-3 years. After that we are unable to satisfy further needs". (Brainstorming session 4)

The supplier explanation relies on the fact that a commercial commitment for production of this item can only be sustainable for a short while (2 or 3 years), and this will make the last batch of the product after which it will be terminated.

Among the described factors for not having a source for the component, production product retirement from NEB has been described as one of the main reasons behind the increasing number of escalator items added to the KONE GSS offering. It has been happening since NEB and R&D work together for the KONE portfolio management in order to define the components that would be become spare parts. The next statement provided by a technical specialist in escalators illustrates this point:

"Due to the introduction of new products, retired production (NEB) components were transferred to KONE GSS data base. However, it was considered, at the first stage, as a necessity to have the material available in the spare catalogue, and it was assumed that all the technical information and the manufacturers were available". (Interview 3)

NEB and R&D working together on the KONE portfolio led to the situation when the number of the components without an established source has significantly increased in the KONE GSS catalogue. An additional reason might be the transfer of production from Europe to Asia during the 1990's, when technical information transferred into the KONE GSS catalogue was not clarified or harmonized enough for all of the offered components. Due to this lack of clarification, defining the correct technical information and specifications of the spare parts required special investigation. This observation was confirmed by an Escalators Mechanical Design Engineer who had the experience in requesting and searching for technical information for some of such components.

"At the moment we are working on a list, that we are able to identify all worm gear's between 1956 up to 1992". (Interview 8).

Furthermore, another reason for not having the information available for spare parts in order to define a source was the lack of product knowledge due to the transfer of production from Europe to Asia. Another reason for the technical information not being

clarified for escalator components is the fact that the present personnel (at the stage of introducing this information to the catalogue) might not have this knowledge or this knowledge might not be available in the company. This observation has been given by Escalators Global Product Manager when commenting on the requested technical information.

“Do not expect any short term solution. With retirement of A we have no competence on this topic in our technical teams any more”. (Interview 7)

However, the current sourcing activities coordinated with Product Development Management aim at assuring the right supplier allocation of the material. The current sourcing activities and their sourcing implications are observed in the excerpt from Interview 1 below:

“Our Spare Parts global category is covering all the topics and issues related to retired escalator spare parts ... with Arturo (and sometime mine) participation in the involved category teams. We intend to increase the communication on category plans and roadmaps, which will have effect also on spare parts offering/ retirement / termination in GSS”. (Interview 1)

The described statements represent the current challenges for KONE GSS in making and having escalator spare parts available. However, KONE GSS has started to provide as a solution and offer repair services with a wider range of components. This solution, when applied, would offer a possibility to send the broken component to KONE GSS key partners in order to make the necessary repairs. The target of this solution is to repair, not manufacture, the items and reach the targeted budgets in order to keep the equipment in operational conditions.

Summing up, the current state analysis of the existing offering of spare parts for escalators by KONE GSS demonstrated that the lack of technical information and some flaws in the previous re-organization and communication among KONE Units generated an offering of components without an established source. These challenges, however, are typical of such situations and there are actions already carried out by KONE GSS to overcome these challenges and streamline the existing process. On the other hand, some limitations in further streamlining the ordering processes for repair solutions can still be faced. These limitations are described in the next section.

4.2.1 Ordering Limitations

To provide a Request for Quotation (RFQ) is seen as a starting point of placing an order with KONE GSS. However, creating an offer for KONE GSS customers is sometimes seen as a challenge. Customers require quotes for their needs, and the information in the quote can make the difference between getting or not the contract.

In KONE GSS, ordering limitations start with the RFQ. The next observation illustrates it with the summary statement made during the workshop held with other KONE units

“Long processing time for creating offers. Technical support and search for material is very time consuming”. (Workshop 1)

Thus, having a well-defined RFQ process, according to the customer expectations, can bring additional business opportunities. Presently, the ordering process of spare escalator components from KONE GSS is done through the next available systems:

- a) Minerva: an online catalogue where technicians can place an order directly from the working site.
- b) SAP: components can be requested by placing a sales order with KONE GSS.

Minerva, being an online catalogue, allows technicians to place an order directly from the working site. This online catalogue shows to the user the item's picture, its technical data sheet, its present stock availability and the sales price. However, *Minerva* might have problems in terms of lack of information or that particular component or this information may not be up-to-date. This observation has been voiced in Interview 6.

“Different layouts in Minerva make it difficult to search for the correct materials (equipment view). Also, the spare part overviews are often incomplete or incorrect”. (Interview 6)

The lack of information in *Minerva* is seen by KONE GSS as a business disadvantage, because it makes KONE frontlines to look and order spare parts on their own, instead of using the solutions provided by KONE GSS. This observation has been confirmed during the workshop held with other KONE units, as shown in the following excerpt:

“New escalator or parts are missing in MINERVA. The difficulty is to find spare parts, sometimes they do not exist”. (Workshop 1)

SAP is the other system used to request and order for components. Through an interface with other KONE Frontlines, the sales orders are placed directly with KONE GSS. One of the limitations observed for handling repair orders in SAP is that the system cannot separate components between the repair projects and the common orders automatically. Therefore, this process needs to be performed manually because the required order needs to be clarified by the frontline and modified manually in order to separate the materials of the order from the normal consumable components.

4.2.1 Current Price Structure

On the other hand, during the ordering process, there have also been found limitations in terms of the offered final price. It has been mentioned to the researcher that the Mark up calculation applied for the sales price is fixed for the current stock components, and it is defined or calculated based on the division whether the item is a commercial or it is the item by KONE design.

Figure 12 shows the price structure for KONE GSS common components:

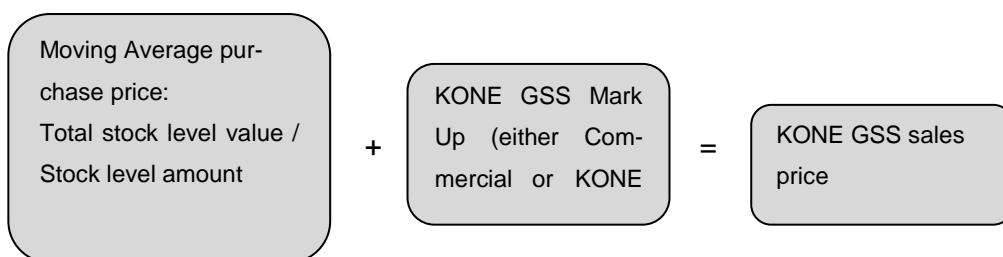


Figure 12. KONE GSS price structure for common components.

In order to calculate *the Sales price*, the product price structure of KONE GSS items is based on the *Moving average price (MAP)* plus *KONE GSS Mark up*. With these indicated elements, SAP can calculate the offered price of an item under the normal conditions order based on the stock level and purchasing price. However, for the repair projects, this system does not work as smoothly at present.

Furthermore, the cost structure itself can present an opportunity for KONE GSS to further improve, since the price level is sometimes can be quite high, as mentioned below in Interview 6:

“Our experience is that GSS is more expensive, and GSS have longer delivery times”. (Interview 6).

Interview 6 provided some explanation of their experience of working with GSS by suggesting the following observation:

“The obligation to work with GSS (e.g. handrail replacement and step chain) makes for lower CMII level because GSS is more expensive than sourcing it directly from the supplier. And delivery times are longer with GSS” (Interview 6)

These observations explain for the lack of competitiveness of the offered price for spare parts due to the current cost structure. Furthermore, for major repair projects, the Mark up to be applied for the items involved in the project differs from the fixed ones. It happens due to the number of items to be requested and the delivery terms, which are an exception from the agreed commercial conditions with suppliers and, thus, deviate from the established budget target for the projects. This structure is described in Figure 13 below.

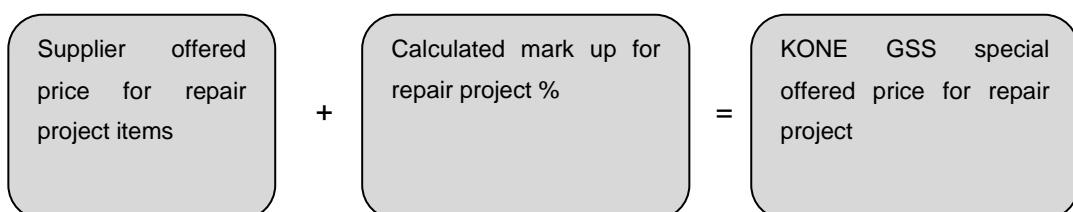


Figure 13. Price structure for repair projects

However, in any situation, pricing a major project repair is always a challenging task. It happens since all the involved items need to be defined, quoted and offered individually, rather than on a regular level. Some of these challenges for quoting major repair projects were mentioned in Workshop 1:

“In major repairs (MOD), the problem is that you never know the final price for customer and you don’t know exactly what to repair. These issues have to get solved with a customer”. (Workshop 1)

Another comment from the same workshop cast some light on the price structure for repair projects and provided some explanation behind the possible high price of the components for repairs:

“Pricing structure is not clear and up to date. Falling prices because small of repair companies”. (Workshop 1)

Summing up, it is challenging not only to quote a major repair project, but also to price its components. One of the reasons behind these challenges is the fact that, currently, SAP cannot segregate automatically the items and the prices which are assigned for a project on repairs from those items which are priced as ordinary consumption. To calculate the right price for a major repair project, KONE GSS has to segregate the items for the repair project manually and then calculate the final price to be offered to the customer. One of the possible solutions for this challenge would be to adjust the current IT infrastructure to secure an automated process.

These limitations represent the challenges for KONE GSS in the current ordering process for major repair projects. They also point to the areas for improvement in order to make the current process more efficient and decrease the work load of the involved parties when requesting spare parts for major repair projects.

4.3 Remarks and Key Findings

The current state analysis revealed several areas for development in the current process and explained for a certain lack of competitiveness for the ordering of spare components for repair projects from KONE GSS. It reveals the fact that KONE GSS is not fully delivering the expected value for its customers due to a number of challenge based mainly on either technological or some other interlinked factors found in the current state analysis. If summarized, these challenges are: a) availability and manufacturing of spares components from the original manufacturers, b) presence of technical information for terminated products in the GSS catalogue, c) KONE GSS price struc-

ture, d) technical information displayed for the components in the online catalogue, e) system limitations in the ordering process, f) delivery time.

The described challenges are seen as limitations for KONE GSS in the current ordering process which result in an image of GSS as an organization that does not yet have this process streamlined. This conclusion is illustrated by one of the observations shared during Interview 6.

“I don’t want to be negative but there should be more communication to get understanding about the way of working from GSS. Now the image of GSS is somewhat negative”. (Interview 6)

Another observation makes a comment related to the KONE frontlines about the possible solutions for KONE GSS:

“I think we should discuss what you can do for the frontlines according TRB projects. At the moment it’s not clear whether a project is big or small and what kind of solutions you can offer to support the frontlines. (Interview 6)”

Other valuable observations made during Workshop 1 concern some operative issues, delivery time, technical assistance and customer service management, as described below:

“Delivery time. It is sometimes not clear and you must ask frequently”.

“Missing systems (for example SAP/ S04). Important to analyze the market in a better way”.

“Sometimes lack of technicians, there is a need for more technicians”.

Furthermore, opportunities in sourcing have been considered when discussing the supporting activities for product retirement. The next statement from Interview 1 illustrates this suggestion:

“Our Spare Parts global category is covering all the topics and issues related to retired escalator spare parts with Arturo’s (and sometime mine)

participation in the involved category teams. We intend to increase the communication on category plans and roadmaps, which should also have an effect on spare parts offering / retirement / termination in GSS". (Interview 1)

On the other hand, limitations in SAP have been observed and shared within KONE GSS functions when ordering spare components for major projects. The next statement was provided during Interview 9:

"This is already ongoing and in SAP side we have been studying e. g. material reservations for SO, advanced MRP planning for SO, handling of stock materials as a non-stock etc... But we are not ready yet with those. On high level the process should follow our normal process (RFQ – Offer – FL PO – SO – (PO – GR) – Delivery) except that GTS should check the availability more critically. If we don't have enough material in stock, FL needs to inform us when they have placed the order separately so that we will know take it to "side" and correct the SO prices according to offer." (Interview 9)

If summarized, the current challenges in repair projects in escalators, due to various reasons, can be put into the following list. This list was developed in a workshop held in Germany with several KONE frontlines, and these most common challenges that KONE frontlines are facing when ordering the spare components from KONE GSS, were also given comments and explanations. These challenges are currently typical only of major repair projects, and listed in Table 5 below.

Table 5. Summary of the challenges ordering spare parts in major repair projects, with respective comments.

Problem	Comment
<i>Pricing structure (clear and up-to-date)</i>	<i>Falling prices because of small volumes for repair companies</i>
<i>Delivery time</i>	<i>it is sometimes not clear and must be indicated separately</i>
<i>New escalator parts are missing in MINERVA</i>	<i>Difficulty to find spare parts, sometimes they do not exist even if listed</i>

<i>Technical support is not guaranteed</i>	<i>Machines from other manufactures are still a challenge</i>
<i>Missing systems (example SAP- S04)</i>	<i>Important to analyze the market in a better way</i>
<i>Long processing time for creating offers</i>	<i>Technical support and search for particular item is very time consuming</i>
<i>In minor repairs, the problem is to wait for the customers decision to make an order</i>	<i>Contact to customer and explain the meaning of the repair</i>
<i>In major repairs (MOD), the problem is that you never know the final price for customer because you don't know exactly what to repair</i>	<i>These issues have to get solved with a customer.</i>
<i>It is sometimes hard to find a customer contact from SAP</i>	<i>Have to update contacts to SAP.</i>
<i>Lack of technicians for some projects</i>	<i>Occasional need for more technicians.</i>

Table 5 describes the most frequently mentioned challenges that KONE frontlines face when acquiring spares for major repair projects through KONE GSS. These challenges were illustrated earlier in Section 4.

Summing up, the current state analysis has revealed some limitations in the current ordering process for major repair projects led by KONE GSS. However, KONE GSS is currently on the way of improving its delivering value to the customers. One of these steps is the decision to develop a business model for the process that would assure availability of the spare parts for escalator repairs. This model has become a need since KONE GSS has established the targets to increase its service performance in escalator business to establish itself as a reliable solution provider for repair projects.

Next section provides a proposal for a business model, based on the literature review and the current state analysis, that can help KONE GSS to formulate its value proposition, define its key resources and key customers, and eventually reach its targets in the development of a well-defined process for assuring availability of the spare parts for major repair projects in escalator business.

5 Building the Model of the Ordering Process

This section presents the model development process and suggests the value proposition for the case company GSS unit. The information for the proposed business model is based on the suggested business model framework described in Section 3.4.

5.1 Business Model Proposal

The proposed business model was defined through the business problem analysis, the current state analysis, and the review of the available literature. The current state analysis included workshops, team meetings and discussions, brainstorming sessions and the researcher's own observations. Furthermore, the business model framework in this Thesis considers theories of service and maintenance business, synthesized into the conceptual framework for this study. Among these business theories, the most important ones for this Thesis are those by Johnson (2008: 5): on Customer Value Proposition, Profit Formula, Key Processes and Key Resources (described in Section 3.3), and elements from Osterwalder (2009) canvas (summarized in Section 3.4).

5.1.1 Suggested Value Proposition

According to Osterwalder (2009: 22), value proposition is the reason why customers choose one company over another, and it consists of a selected bundle of products and / or services that cater to the requirements of a specific customer segment.

In the case of KONE GSS, for escalator components for service and major repair projects, the suggested value proposition is based on the proposition made by the company and described by the questions suggested by Osterwalder (2010: 23) Such questions are designed to reveal the elements suggested to be used for the business model, as indicated below:

What value does GSS deliver to the customer?

- Getting the job done
- Solution Provider
- Offering
- Pricing

-Process harmonization (invoicing and ordering material from one place)

Which one of GSS customer problems is GSS helping to solve?

- Increase availability of spare components
- Improve technical assistance
- Promote logistic solutions
- Price competitiveness
- Process harmonization

Which customer needs is GSS satisfying?

- Reach cost saving to meet budget targets
- Solution provider
- A wide offer of spare parts for the major repair project

Thus, as a value proposition, the benefits that KONE GSS offers to its customers is the assistance in getting the job done by providing solutions in terms of technical assistance by having a competence staff with product knowledge; offering logistic services and storage of components coupled with delivery of the products on the required site and time. Another value proposition is the price competitiveness by having a developed network of suppliers with contract coverage who specialize in spare components. By harmonizing the ordering of spares, in which customers would be able just to place their order and the components would be automatically defined, as well as requested, stored and delivered, the customer value proposition by GSS will become complete. By offering this added value, customers will reach customer satisfaction and GSS will meet the established budget targets and will be considerably helped in assuring availability of spare components for service maintenance and major repairs.

5.1.2 Suggested Profit Formula

Johnson (2008) suggests that profit formula is the blueprint that defines how a company creates value for itself while providing value to its customers. Within the suggested profit formula, all the cost incurred to operate this business model are described, when creating and delivering value or maintaining customer relationship. The profit formula for GSS can be described by replying to the following questions.

What is the key revenue?

- Mark up
- Sales
- Operative income

What value are KONE GSS customers willing to pay?

- Problem analysis
- Providing of a solution
- Spare parts availability

What are the most important cost elements in KONE GSS business model?

- Transportation cost
- Logistic
- Supplier resources investment
- Stocks

In KONE escalator business, the main revenue streams for KONE GSS consist of the mark up cost applied to the spare components listed in the catalogue, sales and operative costs.

As described in the current state analysis, the mark up which is applied to the current spare components is different from that of the components which are offered for major repair projects. It happened due to the difference in purchasing price of the items which might increase or decrease depending of the required volumes. This strategy could be further defined in order to promote the offering of spare components for repair projects.

The propose model would offer to KONE units more cost saving possibilities, because KONE GSS is responsible for defining and controlling the costs of ordering and handling the components. These cost saving possibilities can be achieved by harmonizing processes within the current costs structure. Currently, the cost structure within KONE GSS consists of the product cost, reflected in the purchasing price. Furthermore, the suggested business model also considers within the product cost the investment with the key partners (suppliers) in the development of the tools, engineering or covering the supplier's manufacturing expenses. This investment can then be agreed by contract coverage or long term purchase orders. Furthermore, it is suggested the possibility to keep in supplier's facilities the required stock for service and major repair pro-

jects; the benefit in keeping material stocked remains a possibility with an improved material planning.

Finally, cost structure in the business model considers the expenses within KONE GSS too. These expenses are defined by logistic, infrastructure and administration elements required for processing, ordering and delivering the components to KONE units. These elements can also be considered from the point of view of improving the cost structure.

5.1.3 Suggested Key Resources

Osterwalder (2010: 34) describes the key resources as the most important assets required to make a business model work. Furthermore, the key resources allow an enterprise to create and offer a value proposition, reach the intended markets, maintain productive relationship with customers, and eventually earn revenues.

The proposed business model for KONE GSS suggests the key resources which can be identified by asking the followed questions:

What kind of Key resources does GSS value proposition require?

- People /competence
- IT infrastructure
- Key Partners

What are KONE GSS distribution channels?

- Online catalogue / Minerva
- Customer service officers
- Suppliers in supply chains
- Logistic partners

Who are KONE GSS key partners?

- KONE global functions
- KONE frontlines
- Key Suppliers

The proposed model suggests that for KONE GSS the most important resources are based on the next elements, personnel and its competence to offer solutions to customers. These solutions can be offered during the tender process of the project, and developing the IT infrastructure to interlink the supply chain process of acquiring, selling and delivering material. In order to improve the process ordering, it is necessary to develop IT capacities for placing and following orders in the system. Furthermore, the development of key partners/suppliers in conjunction with KONE GSS's strategy to share and develop solutions when required will further create and deliver value to meet the customer needs. All of the described elements are required to create value proposition to customers.

The suggested distribution channels can be realized through the online catalogue Minerva that offers the capability to be accessed by KONE technicians and employees worldwide. Through such a catalogue, spare parts can be promoted and requested; furthermore, in order to keep and increase customer relationship, customer service officers can provide all required assistance to KONE units during the ordering and delivery process stage already.

The proposed model suggests the development and defining the key partnership by creating alliances (commercial contract agreements), reducing risks and acquiring necessary resources.

It has been suggested that for KONE GSS to develop an established a network of suppliers, who can be reliable to furnish particular resources or perform certain activities, the repair activities for escalator components have to involve only the defined key suppliers. The key criteria for these suppliers would be the capability and competence to perform repairs according to the KONE quality's standards. This type of buyer-supplier relationships should become the key strategy to assuring supplier's reliability and the subsequent availability of the spare components.

On the other hand, the proposed business model suggests enriching and establishing strategic partnership with other KONE functions. This partnership will not only increase KONE GSS competence in product knowledge, KONE frontlines partnership can increase its knowledge of customer needs and improve its customer service currently provided by KONE GSS.

5.1.4 Suggested Key Processes

It is described that key processes or activities are the most important actions a company must take to operate successfully. Furthermore, they are required to create and offer value proposition, reach the intended markets, maintain effective customer relationships, and eventually earn revenues.

For KONE GSS, the suggested Key Processes can be revealed by asking the following questions from the case company:

What are the key processes that KONE GSS value proposition require?

- Portfolio management
- Project assessment
- Problem solving
- Strategic sourcing

What key processes does KONE GSS distribution channels require?

- Automated ordering
- Logistic planning
- Marketing
- Supplier Relationship Management

What kind of key processes does KONE GSS customer relationships require?

- Maintaining customer relationship

The proposed business model suggests improving the current value proposition to customers by offering the processes in portfolio management and by keeping an extended offering of solutions. The services may also offer the assessment in major repair projects in identifying all the required components for the repair project, in addition to providing assistance in designing and solving technical and commercial problems during the project. Furthermore, strategic sourcing is required to define the supply chain processes with suppliers in order to assure availability and reliability of the supplied products. This can be done by maintaining a competitive price level according to the budget targets established by customers.

Distributions channels are further defined within the key processes. As it was stressed before, an automated and not manual ordering process is required when placing and handling the customers' orders. In the logistics, planning to deliver from the manufacturer to site, marketing to promote the KONE GSS solutions through workshops, customer face-to-face meetings or visiting the project on site and maintaining effective supplier relationships, will all help in keeping the contract coverage and offering up-to-date technical and project related information.

Furthermore, it can be defined that KONE GSS customer relationship requires the use of technology to organize, automate, and synchronize its sales, marketing, customer service, and technical support to create a value proposition to customers through the discussed key channels.

5.2 Final Business Model Proposal

Based on the current state analysis of the case company GSS unit and the review of literature, the suggested business models developed by Johnson (2008) and Osterwalder (2009) were considered as a starting point for building a business model of this Thesis to address the current challenges faced by KONE GSS in the present offering of spare parts for escalators. The challenges and limitations of the spare parts business within KONE GSS boundaries have, at the same time, provide the opportunity to re-think the available resources within the organization and visualize what the resulting business model. On the other hand, by analyzing the processes, it was observed that the current limitations are often rooted in the established IT infrastructure and can be overcome in order to strength partnership with key suppliers and improve the collaboration through price offering and improved delivery time.

The business model proposal was developed based on the finding form the available knowledge, as well as the results of field research considering the information provided by the interviews, workshops and brainstorming sessions. With its suggested elements from the available literature and business case, the vision of this business model can be defined for KONE GSS to become a solution provider for spare parts for repairable escalators.

The main elements of the suggested business model are presented in Table 6 below.

Table 6. Suggested Business model for KONE GSS (part 1).

Value Proposition	Profit Formula
<i>What does KONE GSS deliver to the customer?</i>	<i>What is the key revenue?</i>
<ul style="list-style-type: none"> - Getting the job done - Solution provider - Offering - Pricing - Process harmonization (invoicing and ordering material from one place) 	<ul style="list-style-type: none"> - Mark up - Sales - Operative incomes
<i>Which one of customer problems is GSS helping to solve?</i>	<i>What value are KONE GSS customers willing to pay?</i>
<ul style="list-style-type: none"> - Increase availability of spare components - Improve technical assistance - Promote logistic solution - Price competitiveness - Process harmonization 	<ul style="list-style-type: none"> - Problem analysis - Providing a solution - Spares availability
<i>Which customers need is GSS satisfying?</i>	<i>What are the most important cost inherent in KONE GSS business model?</i>
<ul style="list-style-type: none"> - Cost saving - Budget targets - Solution provider - Offer of all spares for the repair 	<ul style="list-style-type: none"> - Transportation cost - Logistic - Supplier resources investment - Stocks

Table 6. Suggested Business model for KONE GSS (part 2).

Key Resources	Key Processes
<i>What Key resources does KONE GSS value proposition require?</i>	<i>What key processes does KONE GSS value proposition requires?</i>
<ul style="list-style-type: none"> - People /competence - IT infrastructure - Partners 	<ul style="list-style-type: none"> - Portfolio management - Project assessment - Problem solving - Strategic sourcing -
<i>What are KONE GSS distribution channels?</i>	<i>What Key processes does KONE GSS distribution channels require?</i>
<ul style="list-style-type: none"> - Online catalogue / Minerva - Customer Service officers - Suppliers Supply chains - Logistic Partners 	<ul style="list-style-type: none"> - Automated Ordering - Logistic planning - Marketing - Supplier Relationship Management -
<i>Who are KONE GSS Key Partners?</i>	<i>What Key processes does KONE GSS customer relationship requires?</i>
<ul style="list-style-type: none"> - KONE global functions - KONE Front lines - Key Suppliers 	<ul style="list-style-type: none"> - Customer Relationship Management

As shown in Table 6, parts 1 and 2 , the customer value proposition consists of the following elements:

Customer Value Proposition

The customer value proposition which could drive the KONE GSS vision of becoming a solution provider for service business and all repairable escalator relies on the possibility to offer to the customers get a competitive product offering and a well-structured ordering process for major repair projects. Furthermore, this value proposition is based

on by offering solutions to customer problems by increasing the availability of spare parts and improving technical assistance through actively involving other KONE units and suppliers in information sharing and promoting logistic solutions (related to warehousing or delivery on site when scheduled). Additionally, this solution offer an opportunity of harmonizing administrative processes to reduce the work load in the ordering process and in order to satisfy customer needs. This value proposition also offers cost saving by utilizing sourcing opportunities in order to negotiate better commercial conditions and assure availability of the required spare parts.

Profit Formula

The profit formula defines how a company creates value for itself by simultaneously creating value for the customers. In the suggested business model the revenues are made through the applied profit margin (mark up) to the offered products. The sales are done through different customers and the operative income is considered as a revenue. The profit formula derives the value that the customer is willing to pay for by offering services from KONE GSS as a solution provider, in addition to offering spare parts proper.

On the other hand, within the present profit formula, the incurred costs are analyzed. For example, the suggested business model considers transportation cost as an important cost, because, for instance, if the material is urgently needed, air freight transportation might be considered. On the other hand, the logistic cost, such as warehouse and stock providing availability, are costs that need be controlled in order to avoid over stock or dead stock on the supplier side. Finally, the required investments in tools or resources for the manufacturing of the components also need to be considered, as well as finalizing the stock rotation in the warehouse. The suggested profit formula, thus, makes emphasis on identifying and controlling the incurred costs in order to avoid overprices or loses.

Key Resources

As described by Johnson, key resources are all the assets required for the value proposition (Johnson 2008: 4). The defined business model proposes to consider people and their competence as an important asset to be developed and included in the value proposition, in addition to the IT infrastructure and administrative processes of

receiving and delivering the orders. Other key resources include the key partners who can commit and assist the organization in manufacturing and delivery of goods and services. Finally, for such a customer value proposition, the effective distribution channels also have to be defined. The suggested business model makes emphasis on using Minerva (online catalogue) to promote KONE GSS offerings, in addition to using customer service officers to administrate personally the ordering process and develop the customer relationship management. As a final distribution channel, the use of logistic partners for ordering and delivery of the goods is considered.

Within these Key Resources, suppliers still remain the key partners. By committing to commercial agreements, suppliers can become reliable partners that offer good and services and can be considered as an extension of the company supply chain process. On the other hand, other KONE functions can be considered as key partners as well, since information sharing is required for materials and processes (especially such units as KONE frontlines).

Key Processes

Key Processes are the activities that are the most important things a company must do to make its business model work (Osterwalder 2010: 36). In the defined business model the key processes that the value proposition requires are related to portfolio management to define what would be KONE GSS offering. The project assessment and problem solving for solution alternatives also need to be provided for repair projects, as part of a customer value proposition. In addition, it is important to consider strategic sourcing for establishing the required commercial conditions with key partners. Since customer relationship processes require automated ordering for making the ordering process more efficient, the involved elements within the supply chain, such as logistic planning, supplier relation management and administrate processes in commercial conditions with suppliers and customer relationship management for following up customer satisfaction, all need to be included in the upgraded automatic tool which would then facilitate the improved ordering process.

6 Discussions and Conclusions

This section overviews the results of the study and also suggests the practical implementation to put the proposal into practice.

6.1 Summary

This Thesis focuses on the ordering process for major repair projects and considers its implications for availability of the spare parts for services in the escalator business.

The objective of this Thesis was to develop a process as a business model for KONE Global Spares Business for ordering spare parts for major repair projects. This enquiry was necessary since KONE GSS has targeted to increase its service performance by modifying its strategy from being a spare parts provider to a solution provider in the escalator business.

This Thesis suggests a business model to improve availability of the spare parts in major repair projects approaching it through the point of view of the customer value proposition. The suggestion behind developing this business model is based on local solutions used by KONE Units in other countries at a local level but not yet shared globally. The objective of the business model is to develop a process that would help increase the offering of solutions and further develop KONE GSS as a service provider.

The analysis and development of the proposal is based on the overview of the current ordering process. For this purpose, the current state analysis of the existing ordering process in KONE GSS is conducted to identify possible areas for improvement. Some weaknesses in the current process were analyzed and steps to improve them suggested to streamline the current ordering processes provided by KONE GSS. The results are based on the interviews, workshops and brainstorming sessions conducted in the case company, where suggestions for improvement were collected.

The results of this Thesis reveal that building a business model is a complex task which requires investments into personnel, IT infrastructure, time and management of resources, in addition to persuading the involved participants to participate in the change to the existing practices. In the development of the business model, also partners and suppliers are needed who can cooperate and collaborate, communicate and share their innovative suggestions. The benefits of the proposed business model for KONE

GSS organization lie in the new customer value creation which could lead to the improved service performance, increased market share and organization's revenues. On the other hand, it can also help to improve the current price offering by saving actions and increased commercial alliances with strategic suppliers through the development of new repair solutions.

Additionally, the model can also lead to improving the collaboration and communication with other KONE functions through information sharing, better understanding of the offered products, solutions, and customer needs. Such link with other functions should be reinforced through the regular programming of workshops and brainstorming sessions, as this study demonstrated.

However, it is necessary to take into consideration that the business model also implies challenges, since a running a business model is an up- to-date process. Therefore, the organization needs to monitor its functionality in order to define whether an adjustment in the value proposition or in the suggested elements of it are needed and whether they are going to be effective. Thus, further research is required to better define the proposed model and discuss availability ad major repair projects at a deeper level.

As stated, the benefits of the business model will improve the customer value proposition by promoting KONE GSS as a solution provider, which characteristic is a "must" looked for by customers in any current global escalator business.

6.2 Managerial Implications

To implement the proposal from this Thesis, the recommendations for managers are to establish a project leader who can be responsible for the implementation and follow up of major repair projects especially, separated from the regular orders. This project leader should be assigned to lead major repair projects in order to keep the coordination between the involved parties.

Furthermore, the project leader should have a strong product and people knowledge and competences in order to use the external and assigned resources since both are limited. On the other hand, the project leader needs to be flexible and change this model, or visualize a new business strategy if required.

For this project leader, it is necessary to consider the next aspects when leading a project:

- a) To define the personnel to be assigned for the development of the business model and major repair projects.
- b) To assist in the development of personnel competences in order to increase the technical knowledge of the products.
- c) To coordinate activities with management team for the improvement and update of IT infrastructure.
- d) Review retirement and termination process of escalator components in order to assure the availability of the information once those become spare components.
- e) Pay special attention to supplier development to increase the cooperation with key partners.
- f) Establish monthly meetings to evaluate the efficiency of the business model elements in major repair project.
- g) Review and improve the customer value proposition which is offered to customers in such projects.

By following the suggested recommendations, the project leader could assure the functionality of the business model and, on other hand, its flexibility if required. In order to identify whereas modifications are needed, the continuous operation of the business model will develop by experience, led by the company and project leader. Such experience will lead to future improvements or adaptations.

6.3 Validity and Reliability

To assure the reliability of this Thesis, it was necessary for the researcher, first, to define the research question and follow this questions during the study; and second, to establish a research design in order to define the steps during this Thesis to meet its research objective. Some methods used to assure the reliability are described as listed below:

- a) Using differing data types and sources: interviews from diverse functions within the company and external suppliers; brainstorming session, meetings and workshops, and own researcher's experience.

- b) Using different data collection sources, including those from the available knowledge: Business Model literature, reviews, interviews, discussions with experts.
- c) Applying an established theory from one area to another: Business model and service business literature review.
- d) Collecting data at different points of time: interviews, brainstorming sessions and workshops in different months and locations.

In this Thesis, validity of the obtained data was ensured by doing both, the literature search (for available knowledge) and the current state analysis of the ordering process for spare parts for escalators from KONE GSS (for identifying challenges and possible improvements). On the other hand, reliability of the Thesis was increased by the fact that the conceptual framework for the business model was built according to the literature review and the data collected from different sources during the development of the business case.

Furthermore, the proposed business model has already started to be used within the company in major repair projects. The findings have been relevant to the organization because, with the current use of the propose business model, KONE GSS has acquired already some major repair projects and it is expected to reach the budget targets set for 2013 by the end of the year. As described, the importance of use of the proposed business model has been proved with these results to the organization and is expected to increase the market share and service performance in terms of availability of spare parts for escalators for KONE GSS. Furthermore, by gaining maturity, the business model can be readapted and verified during the development of these upcoming escalator projects.

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