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DEVELOPMENT OF BUSINESS PROCESSES AND SALES REPORTING – CASE RECOVERED PAPER

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TIIVISTELMÄ

Tämän työn tavoitteena on löytää kehitysideoita liiketoimintaprosesseihin ja sisäiseen myynnin raportointiin kierrätyskuidun hankinta-organisaatiossa. Kehitettävät prosessit ovat toimeksiantaja yrityksen määrittelemiä hankinnan sekä myynnin prosesseja. Yhteistä kaikille prosesseille on, että niissä käytetään myyntitilausta apuna rahavirtojen ohjauksessa. Vaikka organisaation päätavoite onkin hankkia kierrätyskuitua, hankinnassa saadaan myös sivutuotteita, joita toimeksiantaja yritys ei pysty hyödyntämään omassa liiketoiminnassaan ja siten ne myydään eteenpäin. Sivutuotteiden myynnin on tarkoitus tukea hankintaorganisaation strategiaa kierrätyskuidun hankinnassa, joten myynnin tulisi olla mahdollisimman tehokasta. Jotta myynnin tilaa pystyttäisiin analysoimaan, tulisi myynnin raportoinnin olla todenmukaista ja esittää tarvittavat avainluvut.

Prosessien ja raportoinnin tilaa kartoitettiin haastatteluiden avulla, kuten myös mahdollisia ongelmakohtia ja parannusehdotuksia. Parhaita käytäntöjä pystyttiin myös tuomaan toimeksiantaja yrityksen muilta liiketoiminta-aloilta. Teoriaosuus rakennettiin käyttäen aiheelle relevanttia kirjallisuutta ja tieteellisiä artikkeleja.

Tutkimus osoittaa, että prosessit ovat muotoutuneet erilaisiksi hankinta-organisaation eri liiketoimintayksiköissä. Paikallinen lainsäädäntö ja infrastruktuuri asettavat tietyt rajat kierrätyskuidun hankinnalle eikä niihin voi vaikuttaa. Myös voima-suhteet toimittajan ja asiakkaan välillä vaikuttavat prosessien muotoutumiseen. Jotta prosesseja pystyttäisiin ohjaamaan halutulla tavalla, on myös sisäisiä kontrolleja lisättävä. Toiminnanohjausjärjestelmän luomat rajat ja mahdollisuudet ovat myös tiedostettava, jotta toimintaa pystytään tehostamaan.

ABSTRACT

The purpose of this research is to discover development points for business processes and sales reporting in the recovered paper sourcing organization. The processes under development are both sales and sourcing processes that were determined by the commissioning company. All of these processes have in common that there are used sales orders to organize the money flows correctly. Although the main objective is to source only recovered paper, the sourcing also brings by-products that cannot be utilized and are thus sold. As the purpose of the sales function is to only support the sourcing strategy, it should be organized as efficiently as possible. Investigating the current status of the processes and finding development points help in building proposals for enhanced process descriptions. In order that sales function could be analyzed, should the sales reporting be accurate and present the needed key figures.

The current status of the processes as well as the possible problems and development ideas were researched with the help of interviews. Best practices could also be brought from other business lines in the commissioning company. The theory part was build according to relevant literature and scientific articles.

The research indicates, that processes have shaped differently in sourcing organization's business units. Local infrastructure and legislation sets certain limitations to the sourcing of recovered paper, and these circumstances cannot be changed. Customer-supplier power relations also affect to the formulation of business processes. In order to steer the processes, there has to be more internal controls. Still, the enterprise resource planning system also sets boundaries how the processes can be made more efficient.

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ABBREVIATIONS

BIR	Bureau of International Recycling
CE	Central-Europe
CMR	Convention des Marchandises
CRM	Credit risk management
EU	European Union
EIP	Eco-Industrial park
ERPC	European Recovered Paper Council
FMEA	Failure Mode and Effect Analysis
KPI	Key performance indicator
MRF	Material recovery facility
P&B	Paper and board
PO	Purchase order
RCP	Recovered paper
SO	Sales order
TCO	Total cost of ownership
UK	The United Kingdom

1.   Introduction

This master's thesis looks into the development of processes and reporting in purchasing organization in the paper industry. The thesis was commissioned by a case company that determined the topic. The author has interest in the topic based on field of studies, earlier work experience and future career possibilities. In this chapter we are going to look into the background of the case, objectives and limitations, methods and data, key concepts of the thesis and lastly the structure.

1.1.   Background

In the current economic situation companies are pressured to function efficiently. Common understanding within the organization about the strategy and mission is the basis of the whole business. Moreover, to be successful there has to be set long-range goals for sales, profit margin, competitive positioning, personnel training and industrial relations that entails continuous improvement. There is the need to analyze, monitor and implement improvements in order to compete with other companies. In order to set goals effectively, the business processes have to be mapped with detailed activities. (Rash & Rash 2013, 577) Business processes synchronize data, resources and system in the company, and thus have a great impact on the management of business. In order to improve anything, it has to be measured. Reporting in today's business world has increased tremendously, and the potential it has in creating value across the organization has been largely recognized. Thus, without proper accurate reporting, following the company's performance is difficult. (Dumas et al. 2013, 7-8)

The commissioning company for this thesis is a Finnish company, referred hereinafter as Company, which is integrating bio and forest industries. Producing paper is one of the case company's main business areas, but the future of graphic paper does not look bright as the increased use of digital media has caused structural decline in Europe and North America. The tightened market situation has put pressure on business development: the unnecessary costs have to be cut and the efficiency has to be maximized.

However, the case company has not solely concentrated on paper production as it has six business areas. The company has production in 13 countries, employs 19, 600 people globally

and had sales of 10,1 billion € in 2015. The purpose of the company is to create value from recyclable and renewable materials by bringing together know-how and technologies within fiber-based, energy-related and engineered materials businesses. In this thesis the focus is on paper business, and more closely on the RCP (recovered paper) organization's functions. The main task of RCP organization is to source recovered paper as a raw material to be utilized in new paper production. Using recovered paper for new paper production prolongs the life cycle of wood fiber, and can be considered as more sustainable option than virgin fiber. (ERPC b 2016)

As the RCP organization is mainly a sourcing organization and the purpose of RCP sales is thus to support the main strategy of sourcing – the company needs recovered paper as raw material but it also gets other by-products that are not needed in its own processes. The grades used for graphic paper might be sold if there has been a shutdown at the mill or warehouse capacity is already fully utilized, but otherwise Company tries to keep the raw material to itself. In this research, the focus is on the RCP business processes of France, UK, Finland and Central-Europe. As sales is not in the focal point, it should be as efficient as possible. Among graphic paper industry companies, Company is the world's biggest user of recovered paper. The recovered paper is purchased from waste management companies, local municipal authorities and printing houses. As far as possible, the value chain is optimized by sourcing recovered paper locally near the mill to minimize costs and environmental influence. Reusing paper brings cost advantages, as recycled fibers are cheaper as a raw material than sourcing of virgin fibers. Also, in most cases the processing of virgin fibers requires more energy and chemicals than the processing of RCP.

1.2. Objectives and limitations

The objective of this thesis is to map down the current business processes of recovered paper, develop them together with the company's ERP and also investigate the current sales reporting development points. In this thesis the focus is more on the outbound side, but the inbound side is also explained in order to understand the value chain. The market areas in consideration include UK, France, CE and Finland. CE as an area includes Germany and Austria, but the governance of the functions is done mainly in Germany.

Now that the paper market has diminished and the company has gone through severe saving programs, also the sales function has been taken under development. Accordingly, Company states that in 2016: "The business performance is underpinned by the company's growth projects and continuous cost efficiency measures". The focus of this thesis on reporting is developing internal sales reporting for management use, and not financial statements for external stakeholders. Furthermore, the utilization of the reporting information is not researched in detail.

The research question is: How to develop business processes and internal sales reporting of the RCP organization?

Sub-questions:

1) What are the current business processes?
2) What development points have incurred in these business processes?
3) How to develop the business processes in terms of information system and general business process steps?
4) What kind of reporting is necessary in the sales of recovered paper and other side products?

The aim of the first question is to map the business processes that the commissioning company wants to be developed. These processes are called as sales processes as the processes include the usage of sales orders to make the money flow correct. In reality the processes are not all sales, but also sourcing. There are different kinds of processes that require different types of sales orders. By mapping the current business processes it is easy to compare the processes in different business units and look into the development points that are investigated with the second sub-question.

The third sub-question focuses on finding development points for the business processes. With the help of the development points can be created enhanced process descriptions, and also include information system related characteristics. The information system in this case is SAP enterprise resource planning program. The approach to the development could be either refining the processes or going through more thorough re-engineering.

The purpose of the last sub-question is to find out how the reporting of recovered paper should be developed – what and how is reported currently and how the reporting should ideally be. The current status of the reporting is investigated in SAP, and the requirements are mapped according to the interviews. Also, best practices are brought from other business units.

The basic idea of improvement cycles DMAIC (define, measure, analyze, improve and control), PDCA (plan, do, check and act) and similar have been utilized in process improvement widely. The terms of Business Process Refining, Business Process Re-engineering and Business Process Improvement are well covered in the current researches, but the actual ways of improving processes systematically has gained less attention. The approach of six sigma strives to statistically cut down the variation in processes, assuming that variation is the reason for defects (Charron et al. 2015, 329). However, it is not a suitable tool for processes that need more drastic rebuilding, but it could be used after the rebuilding has been done. Benchmarking has also been widely recognized as a tool for improvement. The uniqueness in this case study is that the business process improvement is considered in both general level and in the information system, SAP. Also, the business processes that need improvement are considered in connection to paper raw-material markets, which have different characteristics than in consumer commodity markets.

The role of financial reporting in companies has been researched widely. The differentiating factors in this research are that 1) the sellable items are recovered materials, 2) the system's role in the reporting is analyzed in detail and 3) the needs for reporting are mapped by certain people inside the commissioning company in paper industry.

1.3.   Methods and data

This thesis includes two parts: theoretical and empirical. The theoretical part will consist of literature review that will look into recovered paper business and the business process improvement steps. The sources used for the literature review include scientific articles and books, but also relevant Internet sources.

The empirical part will be based on qualitative research and it is done via single-case study in the paper industry. The objective of a case study is to get multiple perspectives of a single case or several cases at this point of time or over a period of time (Cooper & Schindler 2010, 181).

The research concerns four market areas, and in order to get comprehensive understanding of the current business processes it was important to interview relevant personnel from all of the business units. In order to find improvement ideas and best practices, the research looked into internal benchmarking opportunities. Internal benchmarking was considered as the best option because the issues are sensitive in a way that most companies do not share them publically.

1.4.   Key concepts

Business processes synchronize data, resources and system in the company, and thus have a great impact on the management of business. Processes bring the clarity in everyday functions helping the company adapt to new circumstances and meeting the legal requirements. After all, processes affect revenue prospective as much as it affects the cost structure of the company. (Dumas et al. 2013, 7-8)

Recovered paper (RCP) is paper that is utilized after it had been waste. Cellulose fiber is an important raw material for paper industry, and utilizing recovered paper for new paper production prolongs wood fiber's life cycle. Recovered paper can be reprocessed into materials, products or substances. (ERPC b 2016; Department for Environment, Food and Rural Affairs, 2016)

Value chain is a set of activities that add value in the eyes of an end customer. Companies have to concentrate on delivering superior profitable customer value in order to be successful. In a supply chain the superior value proposition builds up from multiple actors: supplier's supplier, supplier, buyer and lastly customer that realizes the value. However, value chain has much been replaced with **value networks** that are more complex; there are multiple players that collaborate to benefit the whole group. The collaboration means buying and selling products or materials as well as sharing information. (Fearne, et al. 2011, 575) In order to make processes more efficient, it is important to realize the value adding and non-value adding steps in the processes.

Business Process Improvement (BPI) is an approach how companies can enhance the effectiveness and efficiency of their business processes. The effectiveness and efficiency is considered mainly in terms of quality, time and costs. By improving processes companies adapt to changing internal and external circumstances. (Rasha & Rasha 2013, 579). The approach can be divided into two areas based on their degree of improvement. Business process re-

engineering (BPR) means more of a radical improvement, whereas BPI is more moderate. There are multiple improvement cycles that have been discussed in the literature, but they are similar in nature. In all of the models there are in some form the initiatives of plan, do, check and act. (Zellner 2011, 205-206)

1.5.   Thesis structure

This thesis consists of two parts: theoretical and empirical. In table 1 below is shown the structure per chapter and the main ideas this chapter includes. The chapters from 1 to 4 can be defined as the theory part, and latter part from 5 to 8 as empirical part.

Firstly, there was explained the background of the case and main characteristics of the research. In order to understand the theoretical context, some key concepts are defined before the actual theory part. The theory starts from more practical information about waste management in EU, as the research considers four business units in the EU-area. EU's approach towards waste management has also affected the local legislation and steers the future development as well. The theory part continues to explain the ideology of circular economy that also the commissioning company is implementing to some extent. After that the collection of recovered paper is investigated as it has big impact on both the sourcing and the sales of RCP. At the end of the chapter an insight to the RCP markets is given; what is the role of RCP in the raw material markets, what RCP grades are sold and how is the market expected to develop.

In the next chapter, improvement of processes, the improvement process is explained in detail. The chapter starts with the definition of the business process, and how the process can be mapped. Next the framework for improvement is explained: in order to improve anything there should be some kind of measures to see the improvement. However, abstract things are hard to measure and also improvement can mean multiple things. The next steps of improving are analysis, improvement and control that are covered in detail as well. Lastly, the theoretical framework is summarized in order to remind the reader about the main theoretical ideas.

The fourth chapter covers the research method. In this chapter the chosen research approach is justified, the research process is described and also the reliability and validity is evaluated. The fifth chapter starts the empirical part by explaining the implemented improvements during the research process, and also the current process descriptions. In the process descriptions all of the business processes that require the usage of sales order in RCP organization are explained. For all of the processes there were also made process flow charts, but only one is shown as an

example. In the sixth chapter the development points that came up in the interviews related to ERP-system and on a more general level are covered. The empirical part continues with analysis of the current reporting, what are the requirements for a new enhanced report and also an alternative reporting tool is introduced. Lastly, is presented the conclusion and discussion.

Chapter	Content
1. Introduction	Background, Objectives and limitations, Methods and data, Key Concepts
2. Recovered paper business	Waste management in the EU, Circular Economy, Collection of recovered paper, Sales of recovered paper
3. Improvement of processes	Definition, Business process mapping, Framework for improvement, Process Analysis, Process improvement, Control, Theoretical framework
4. Research Methods	Qualitative research, Research process, Validity and reliability of the research
5. Current Processes	Implemented improvements, Current process descriptions,
6. Process development points	System related development points, General development points
7. Reporting	Current situation, requirements of enhanced report, alternative reporting tool
8. Conclusion and discussion	Main results in relation to theory, further research

Table 1. Structure of the master's thesis

2.   Recovered paper business

All companies are subject to limited economical resources. Using the available resources efficiently benefits companies' economies as well as the environment around us. In this chapter we look into the overall waste management in EU, the concept of circular economy, collection of recovered paper, and business of recovered paper.

2.1.   Waste management in the EU

Waste management is as old as human civilization, but the focus has changed since towards modern waste management. The change was driven by industrialization that brought new materials and chemicals to usage, and thus changed the types and composition of waste as well as the overall management of it with collection and handling (Ghisellini 2015, 19). Christensen (2011, 3) describes the term waste as "redundant product or material that has no marginal value for the owner and is thus to be discarded". However, products can have very different retention times: newspaper can be used only for one day whereas furniture can be used for several years. Recently the attitude towards waste has been changing. More and more people see waste management as a way to recover resources and prevent environmental impacts.

Management of waste varies significantly between countries. The differences stem from the composition of waste, availability of land, opportunities for utilizing the waste, costs, political decisions and national interests. The objective of EU waste management policies is to reduce health and environmental impacts of waste and to develop resource utilization into more efficient direction. The role of waste management is crucial in efficient resource handling and it has big impact on sustainable economic growth of the continent. Waste has both financial and environmental effects: it has to be collected, sorted and transported. These processes can become expensive financially speaking as well as environmentally through greenhouse gas emissions. (Christensen 2011, 13; EU a 2016)

Companies and governments are the key players pushing the enablers by redesigning processes and products. As well as local legislation, also the European Union steers the resource efficiency. The EU has different approaches towards waste, and it is described in the waste hierarchy in figure 1. In the waste hierarchy prevention is the most favorable approach and

disposal the worst approach. Preparing for re-use, recycling and recovery are the next approaches if prevention is not possible. (EU b 2016)
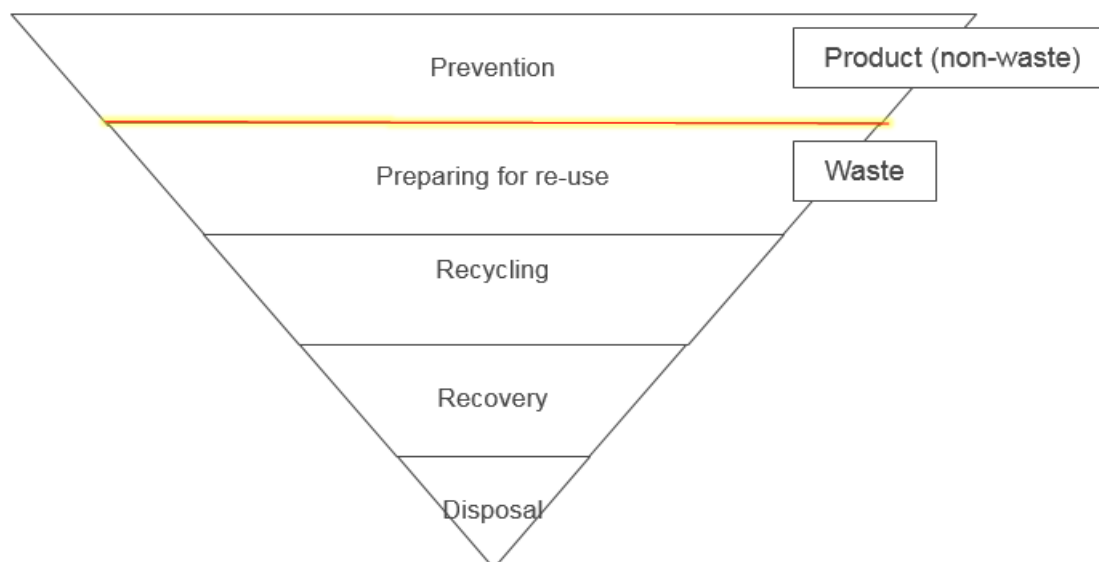
Figure 1. European Union waste hierarchy (EU b 2016)

The approach of waste prevention is achieved by encouraging the usage of eco-design i.e. favoring secondary recycled raw materials and avoiding hazardous materials. Also by developing the manufacturing systems and influencing consumers' consumption habits can work as part of the waste prevention. Re-use means that products or components can be used for the same purpose for which they were made before. The re-use of e.g. clothes and furniture has economic, social and environmental benefits: re-use can create jobs and make products available to a wider group of people. (EU a 2016)

Recycling decreases the amount of waste that ends up in the disposal, and also diminishes the amount of sourced raw materials from the nature. Recycling provides industries important raw materials such as paper, glass, plastic and metals. Recycling also affects to the energy usage as e.g. when recycling aluminum it saves 95% of the energy needed to make an aluminum object by sourcing the raw material from nature. If the material could not be re-used or recycled, it can also be incinerated. Today's waste incineration facilities can be utilized for producing electricity, steam and heating for buildings. In some industrial processes waste can also be used as a fuel. The most environmentally hazardous approach is to put the waste into landfill.

Landfill can cause methane releases, which are 25 times more effective than carbon dioxide. (EU a 2016)

European legislation has been one of the key drivers of promoting enhanced waste management, recycling, cutting the landfilling amounts and creating enticements for consumer habits (EU b 2016). The legislation in the EU in terms of waste management is set in the Waste Framework Directive that incorporates rules such as management of hazardous waste and regulation on waste shipments. It is also set by the law that municipalities have to establish waste collection systems, but the waste operators might still be privately owned or privately managed. In many countries municipalities can make their own decisions about the on source separation, treatment of waste and how the disposing facilities are arranged (location, type and capacity). On source separation or segregation means that how the waste is separated into different waste types, material fractions or material sub-fractions for collection. Consequently, these operators can also charge people a desired fee for using the waste management system. (Christensen 2011, 14; ERPC a 2016; EU a 2016)

2.2.   *Circular economy*

The concept of circular economy is seen as a resolution for coordinating ambitions between economic growth and environmental awareness. Turning waste into a resource will enhance the change towards circular economy and away from the liner economy of take-make-use-dispose. The aim is to make resource usage more efficient in order to achieve a more balanced situation between economy, environment and society. (Ghisellini et al. 2015, 11; Lieder & Rashid 2015, 37) Lindhqvist and Lidgren (2010, 8) describe the current linear economy as cradle-to grave, whereas the closed-loop cycles of materials has the cradle-to-cradle approach by reducing, reusing and recycling. Even though circular economy is often characterized with the recycling principle, it might be a less sustainable solution than reduction and reuse in terms of profitability and efficiency. One of the core ideas of circular economy is that the products at the end of their life cycle should be released back into the industrial cycle as a material and energy. Some materials can be recycled until a certain point: cellulose fibers can be recycled 4 to 6 times until the fiber's features weaken, contrary to metals that can be recycled unlimited times. (Ghisellini et al. 2015, 16)

In the current linear economy the value that would be gained in efficient resource use is lost in three phases. The first one is optimizing material usage in production in order to minimize the waste of production. Secondly, value is lost in the current short consumption cycle; after the usage the goods become waste and the raw material value is minimal. Thirdly, the highest level of potential value is not captured from material necessarily just be recycling because reuse in manufacturing can bring higher value e.g. when a filter cannot be used for one purpose it can be transferred to another production process instead of recycling the filter. (Arponen et al. 2015, 4-5) Still, the change form one approach to another is not simple. The change is based on social, technical and organizational innovation throughout the value chain. Witjes & Lazano (2016, 2) list the enablers of changes as:

1) Skills and knowledge
2) Organizational innovation
3) Social innovation
4) Technological innovation
5) Financial tools
6) Awareness
7) Involvement of multiple stakeholders

Ghisellini et al. (2015, 14) open up the list of enablers similarly as Witjes & Lazano. On a micro level, adoption of circular economy requires that companies are engaged in building strategies to improve the circularity of its production systems. Moreover, companies have to cooperate with each other in order to build a circular pattern in their supply chain. The same way as in organic ecosystems scavengers and decomposers process dead organic items and nurture living organisms, also companies can extract resources out of waste. Scavenger companies collect the waste and deliver it to other companies that can sort and dismantle the material. Then the material is delivered to decomposer companies that transform or recycle the materials into new materials or products.

In the next level of circular economy, industries that usually function as separate entities are engaged in resource exchanges creating a so called industrial symbiosis. The purpose of industrial symbiosis is to achieve economic and environmental benefits by taking full advantage of by-product utilization and simultaneously diminishing residuals or treating them efficiently.

Industrial symbiosis companies can be located separately, but in an eco-industrial park (EIP) also the benefits of a common location are exploited. With a common location the transportation and facility costs can be diminished. The benefits of both EIP and industrial symbiosis can be divided into direct and indirect. The direct benefits include e.g. revenue resulting from by-product sales, reduced costs of disposal and cost savings through cheaper by-product sourcing. The indirect benefits include e.g. higher security of supply, flexibility and better reputation. However, companies mainly engage in EIP projects only because of economic benefits thus leaving environmental benefits just as side-effects of their decisions. In order to support this ideology, public authorities should support EIP initiatives through legislation, economic instruments (subsidies, taxes) and other enabling factors such as infrastructure (roads, energy availability). (Ghisellini et al. 2015, 18; Zhu et al. 2007, 32)

In the near future the business environment will face new challenges as the availability, price and use of resources is about to change. The rising prices of raw materials push companies to enhance efficiency in product design phase, production and at the end of a product's lifecycle. Rising standard of living, population growth and urbanization will increase the demand for raw materials, and require a new kind of thinking and business models. (Arponen et al. 2015, 6)

2.3.   Collection of recovered paper

The collection of RCP differs from one country to another and even inside a country. In order to get the recovered paper, paper companies have to cooperate with waste collectors, municipalities and publishing and packaging industry players. For a long time most of the recovered paper came from industrial and commercial sources, but as the general amount of paper in circulation has diminished, also additional sources such as households have been taken into usage. The quality of recovered paper is one of the factors that affect to the quality of the newly produced paper. Recovered fibers are best suited for newsprint and packaging, but also fine papers can be produced from recovered fibers. (ERPC a 2016)

In Finland the recovered paper is recycled to a very high percentage via segregated waste collection at source. In 2014, 81% of consumed paper and cartons were collected for new usage, as globally the percentage was about 60% (Metsäteollisuus 2015). However, not all paper can be recycled as cigarette papers, wall papers, tissues and archives are not suitable for reuse (ERPC c 2016). Despite of the high percentage of recovery, the recycled fibers only total 5%

of the whole supply of fibers for paper and carton production in Finland, and the rest are virgin fibers. Most of the recycled fiber comes from households with 56%, as 5% come from office usage, and 39% from industry. The usage of virgin fibers is a natural choice for Finland because of the generous supply of wood. Moreover, 90% of the paper produced in Finland is exported and collected again after usage mainly in the biggest market area, Central-Europe. Paper can be recycled from 4 to 6 times as the fiber becomes shorter and weaker after each time, so Central-Europe is gaining from the usage of virgin fibers in Finland as well. (Metsäteollisuus 2015)

In the UK 49% of the sourced paper is collected from households as commingled waste that can behold fractions of plastic, metal, glass, paper, textiles and organic waste. The waste collection can also have a separate bin for glass and one for paper and board, leaving everything else in the third bin as commingled waste. The waste separation at source can vary between municipalities as mentioned before. On average however, segregated collection equals 33% of the recovered paper sourcing, and mixed P&B (paper and board) with 18%. Commingled waste has to be sorted for further reuse (Waters 2013, 115). In 2011 Company built a MRF (material recovery facility) on-site UK plant to ensure long-term supply of raw materials from recovered newspapers and magazines. MRFs are planned to process flat fiber stock, such as cardboard and paper, and containers. However, small fractions e.g. glass or metals, and flexible materials can harm the MRF machinery and affect to the sorted material quality. (Yosemite 2015)

The advantage of Company sorting paper by themselves from collected, commingled dry recyclable waste is that the quality can be controlled more carefully. Additionally, the transparency of the material flow can be ensured. The current sourcing contracts are flexible in terms of amounts, so the sourced volumes are not guaranteed in beforehand. Also, one important factor for the quality of produced paper at the mill is the quality of the sourced recycled paper. Thus, the quality should not be weakened at any point or it will affect to the end product. Along with paper and cardboard, the MRF sorts plastics, containers, wrappings and glass to be sold to other refineries. The total projected capacity of Company UK MRF is 270 000 tons of commingled materials per year.

In France 57 % of the paper is sourced from commingled waste collection and segregated collection with 32%. P&B equals 11% of the collected recovered paper for reuse. Company mainly purchases a certain grade, 1.11, which is suitable for their further processing at the mill.

Still, they also purchase mixed paper grade 5.01 that might still need further sorting at the paper mill depending on the end product. Company has a sorting facility in France, where they separate cardboard from the paper. If the quality of the purchased grade is not good, it will affect to the end product's quality negatively.

In Germany the P&B collection covers 90% of the sourced recovered paper. Commingled and segregated collection equal 5% each. In the Central-Europe Company has two sorting facilities as joint ventures nearby the mills and one at the mill. These sorting facilities are to ensure transparent flow of the raw material.

Before the fibers can be lead into the production process they require further processing. The recovered paper and cardboard has to be cleaned with mechanical cleaning and depending which paper is going to be produced, also de-inked. De-inking is needed for e.g. graphic paper production and hygienic products. The pulp is filtered and screened multiple times before it is proper for paper production. (Christensen 2011, 205-206)

2.4.   Recovered paper market

The world has globalized in a quick phase, and thus the interrelationships between the production, material usage, and management of waste is becoming more complicated and dispersed around the globe. (Ervasti et. al 2016, 35) Price volatility is an undeniable fact in the recycling markets. However, it is possible to manage the revenue fluctuations with contracts that behold price floors or other revenue and risk sharing conditions. Recycled material prices are prone to trail contractions and expansions in the general demand of produced goods. Simultaneously the current trends in one industry can affect other industry's recycled material prices. (Sound Resource Management 2016)

The price difference between virgin material and recycled material is clear. In the figure 2 below the price difference between unbleached softwood kraft pulp and recovered cardboard is presented. On the X-axis is presented the time line starting from the year 1993 and ending to the current year 2016. On the Y-axis is presented the price in dollars for ton of the material, red indicating virgin wood pulp and blue for recovered cardboard. Paper and cardboard are produced from pulp that is derived mainly from wood. The sourcing of virgin raw material can thus include the costs of logging, transporting the logs and processing them at the paper mill.

The processing can be either mechanical or chemical. Mechanical pulping requires high pressure, variety of chemicals and plenty of electricity. In chemical pulping there are used special chemicals that extract the cellulose fibers from impurities. Although recovered grades also require processing, the costs of processing are still significantly smaller. Thus, the price difference between virgin fibers and recovered fibers is explained. (Christensen 2011, 203-204)
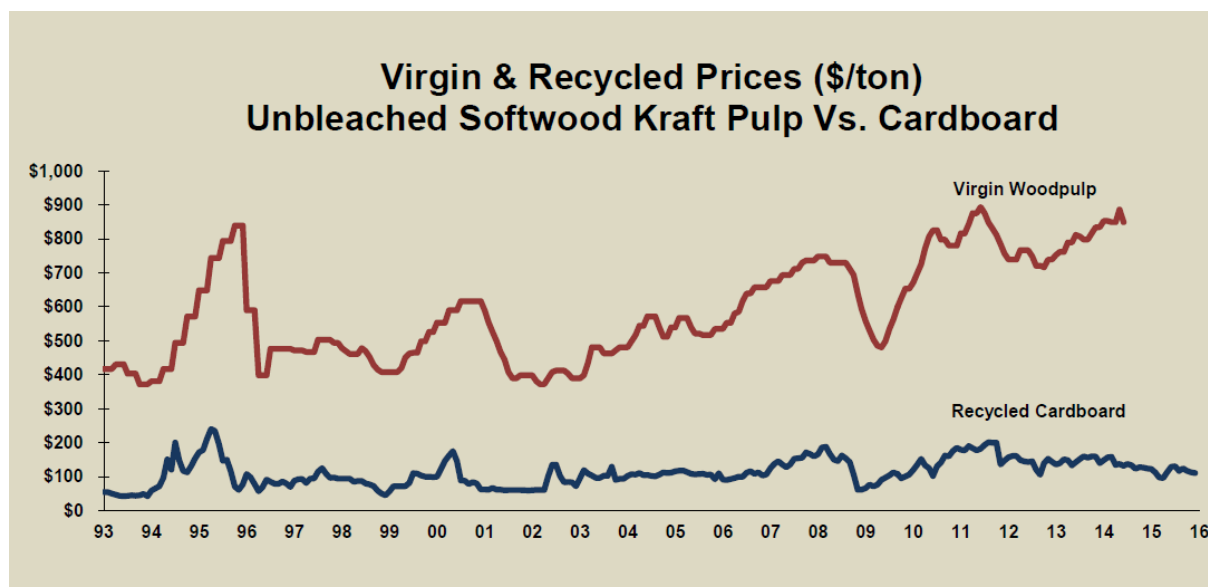
Figure 2. Virgin fiber versus recycled fiber prices (Sound Resource Management 2016)

Production technology defines whether recovered paper can be utilized or not, and the amount it can be used is much dependent on supply of recovered paper from the market (Mansikkasalo et al. 2014, 28). Although the recovered fiber is cheaper than virgin wood fiber and also more sustainable in environmental sense, the growth of recovered fiber usage has limitations. Firstly, the current high rate of recovered paper utilization and recovery does not give endless possibilities for raising the rates. Secondly, pulp capacity will be added in the next few years which will increase the availability of virgin wood fiber. Lastly, the non-wood fibers are strengthening their position in the market because of development in non-wood manufacturing. However, the non-wood fiber market will remain small-scale compared to recycled and wood fiber. In emerging economies, such as China and India, the demand for high quality paper and board products will slow down the demand for recovered fibers as well. (RISI 2016)

The recovered paper and board contain different grades. The grades are divided into 1) ordinary grades, 2) medium grades, 3) high grades, 4) kraft grades and 5) special grades. These groups contain different types of material such as:

- 1.01 Mixed paper and board, unsorted, but unusable materials are removed: A mixture of various grades of paper and board
- 1.05 Old corrugated containers (OCC): Used boxes and sheets of corrugated board of multiple qualities
- 1.11 Sorted graphic paper for deinking: Sorted graphic paper from households consisting of newspapers and magazines
- 2.01 Newspapers
- 3.01 Mixed lightly colored printer shavings
- 5.01 Mixed recovered paper and board: Unsorted paper and board that is separated at source (European List of Standard Grades or Recovered paper and Board 2002)

All of these different grades have different prices in the markets, but often the material is sold as mixed material. The figure 3 below presents the global trend in RCP sales. China was in 2010 and still is the world's largest buyer of pulp and RCP. The change from this 2010-figure is that the growth of RCP demand is led by both Asia and Latin America in the following years. The Far East Asia outside of Japan and China is expected to surpass China in the demand of RCP in near future. In Latin-America the demand is projected to grow substantially elsewhere than in Brazil. The supply of RCP will increase in the developing world along with higher demand and emphasizing the importance of recycling. (RISI 2016, 13)
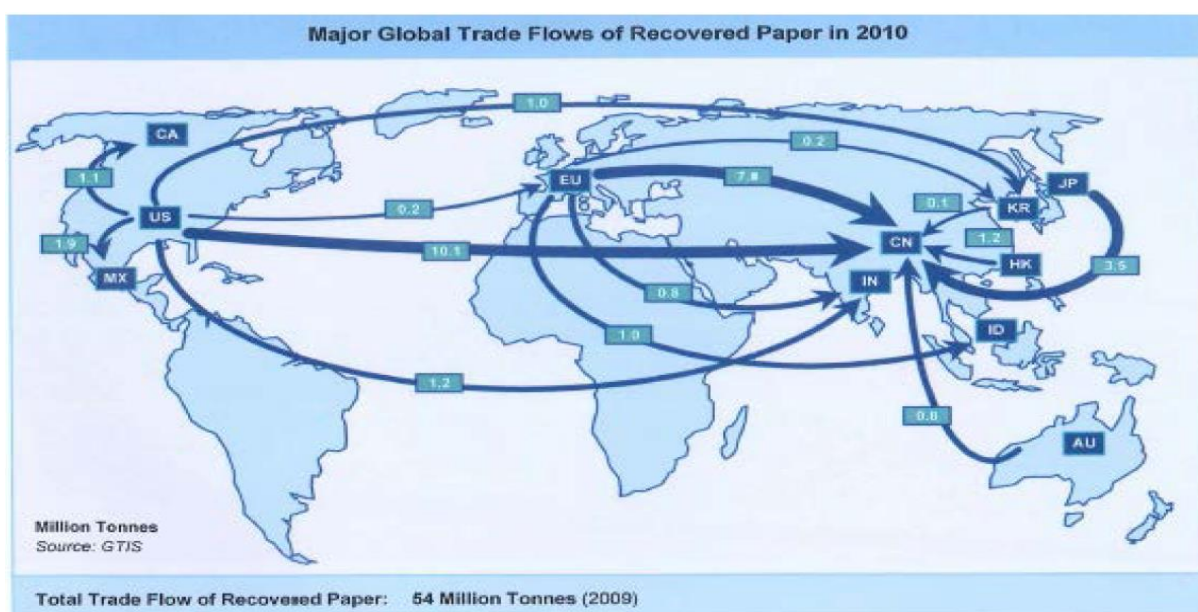
Figure 3. Major Global Trade Flows (BIR 2010)

The global paper recovery rate in 2014 was 58%, and it is expected to grow by 2 to 3% per year, reaching the recovery rate of 60% in 2019. The most important driver for higher recovery rate stems straight from the growing demand for recovered paper: in the next five years in total the demand for recovered paper is expected to grow by 2,1%. The expectations in the industry are that recovered paper will continue to displace wood pulp in the future as a raw material, but at a slower pace than earlier. The slowing trend is due to the declining consumption of some paper grades in developed countries. Furthermore, China's projected GDP growth and paper and board production growth has been lowered according to the current trend. (RISI 2016, 13-14)

3.   Improvement of processes

In this chapter is presented firstly the definition of business process and then the improvement cycle of business processes. The logical improvement cycle identified by multiple theorists is described as define, measure, analyze, improve and control (DMAIC). Process improvement efforts should enhance the company's competitive situation in terms of time, quality and costs.

3.1.   Process thinking

Business processes synchronize data, resources and systems in the company, and thus govern the management of business. (Dumas et al. 2013, 7-8) Process thinking is based on the idea that there are series of actions which together create value for the customer (Laamanen & Tinnilä 2009, 10). Business processes have to be built in line with organization's strategy in order to maximize the value creation without forgetting the value capturing. Laamanen (2001, 20) summarizes the term process as a combination of activities, resources, artifacts and performance. Salomäki (2003, 118) widens the term by dividing process into factors that affect to the process outcome: process user, material, machinery, method, data and environment.

A process can also be viewed from an information processing perspective: process converts inputs into outputs. Process is a type of knowledge that can be shared once it is modelled. A well modelled process creates common understanding in the organization and enables fluent co-operation. This kind of process knowledge, such as checklists, models and templates are necessary in the application of a process. (Laamanen & Tinnilä 2009, 69-70)

Processes can be divided in multiple ways. Laamanen (2001, 54) divides processes into core- and support processes. Core processes build up the organization's purpose that stem from external customers' needs. Support processes support the core processes, and the value it creates is directed to internal stakeholders. Fleaca & Fleaca (2015, 956) divide the processes similarly into operating processes and management processes. Operating processes are the basis of the organizational value chain facilitating the creation and fulfillment of stakeholder demands. Management processes are the supporting processes that enable the fulfillment by providing the needed resources. Milani et al. (2016, 57) divide the processes into main process and sub-processes. Main process does not belong to any wider process, and it consists of multiple sub-

processes. Sub-processes can be decomposed into even smaller sub-processes until there are left the items building the process.

Organizations that do not have a clear strategy and mission are often ineffective. Mission states the purpose of the organization, what it is doing and what it does not do. Thus, it forms the grounds on which the company's goals and objectives are based on. (Rasha & Rasha 2013, 579-580) Many organizations are struggling with implementing these strategies of efficiency, quality, speed and flexibility (Laamanen & Tinnilä 2009, 15). One reason for this might be that organizations do not know their own value creating processes and that results in incoherent views of what is critical in day-to-day actions for the company's success. Companies are as efficient as their processes are. Windsor (2009, 307-308) presents that corporate governance should ensure the shareholders benefits by improving the company's performance and ensuring conformance to regulations. Also the aspects of ethics, transparency, accountability and disclosure are related to corporate governance actions. Also Riwayati et al. (2015, 633-634) divide corporate governance into two perspectives: performance and conformance. Conformance actions steer the compliance with laws, regulations, policies and responsibility. Performance is connected to policies and processes that have to be steered. The factors affecting to performance lie in risks and opportunities, value optimization, strategic decisions and resource utilization.

The pressure for improvement comes usually from outside the company: desired level of return on investment, competitors' actions and changing customer needs. Effective processes imply that once organization creates enough value in relation to costs, there is the possibility for financial success. In order to get a comprehensive analysis of the process, all of these factors have to be considered. Laamanen and Tinnilä (2009, 10-12) state that process enhancement can be done either via process improvement or process management. Process management can be done only by managers who take charge in the key processes. The process owner maps the process, evaluates the process performance and sets goals for enhancements. However, in process improvement the way of doing is changed: if the process is not changed, there can be no better results. This might require development of know-how, systems, working habits and relationships with different stakeholders. Another approach is presented by McAdam (1996, 65-66), who sees the process improvement through four steps:

1. Identify the process for improvement

2. Analyze processes

3. Improve the processes

4. Implement the enhanced process

The step of identifying the processes for improvement includes defining the processes and finding the critical ones. Also in six sigma statistical improvement cycle the process starts by identifying the processes as the first step is named as define (Zellner 2011, 206). The critical processes have potential to be improved. By analyzing the processes the improvement team or person gets a comprehensive view of the current state of the process. The current state is estimated in terms of cycle time, costs, quality and added value. Also in six sigma the phase is similar as it advices to measure the process performance; without measuring the improvement is not proven. However, in six sigma the steps of measuring and analyzing are separated from each other. Next phase in McAdam's model is to actually improve the process with small process changes or by totally re-engineering it. The improvement process includes firstly making sure that there is suitable expertise available among the personnel to meet the needs of the process or it can be also acquired outside the organization. Secondly the benchmarks have to be established. The factors benchmarked internally, externally or generically can involve e.g. the actual process flow, measures, boundaries, organization structure and roles. However, there are constraints that might make benchmarking challenging such as organization culture, customer requirements and supplier requirements. In six sigma ideology the improvement is based on cutting variation that is the source of defects (Muralidharan 2015, 427). However, the six sigma approach is not suitable if the need for change is more radical than just cutting the variation. McAdam states that after determining improved version of the processes comes the implementation phase where changed practices, roles, responsibilities and measuring systems are brought to real life. Still, regular review practices should be implemented in this stage in order to stay updated with the performance level of the processes.

Pastinen (1998, 34) emphasize that all in all process improvement efforts should enhance the company's competitive situation in terms of time, quality and costs. If the quality is improved also less time will be required to produce the output. This is based on the assumption that when there is consumed less time for production, there will also be less time for defects to appear. As the process requires less time it is prone to also cost less e.g. when there is less work required to produce the product.

3.2.   *Business process mapping*

In order to understand business structure, the business processes have to be identified. Business processes are often presented as process models that consider processes as fixed routine activities. Business process modeling is a tool that is needed for process improvement and building of information technology applications. (Rasha & Rasha 2013, 580) Laamanen and Tinnilä (2009, 10) emphasize the role of process modelling in identifying the value creating actions. Arcidiacono et al. (2012, 16) emphasize similarly that process mapping describes the analyzed process to recognize critical points, both value adding and not value adding activities. If the modelling succeeds and the value creation is optimized there can be multiple benefits detected. Customer experience can be enhanced, and that affects straight to the customer's willingness to buy these products or services in the future. Internally, the employees understand better the bigger picture and their role in the value creation. This might affect positively to their motivation and collaboration with the different people throughout the organization.

Developing information systems in the company is one of the most common reasons for building process models. With the help of an information system the processes are strived to be harmonized and synchronized. Usually there are less expenses with a process that is stabilized than a process that is rebuilt over and over again. The costs can be reduced by diminishing the usage of resources. Instead of pushing people to do more, people should just do things differently. The main idea of standardization is to prevent people from returning to original disorganized ways. When standardized actions are applied, the uncontrolled happening will change into controlled or standardized occurring. (Charron et al. 2015, 258; Laamanen & Tinnilä 2009, 12)

According to Laamanen (2001, 76) a good process description should 1) include critical issues concerning the process, 2) describe interrelations between issues 3) help in understanding the bigger picture and people's role in it, 4) advance people's collaboration with each other, and 5) give enough flexibility depending on the case. The team or person describing the process should decide which things are relevant to present in a process model and which are left out. In table 2 below relevant questions which should be thought over when building the process models are presented.

1. Application of process
    • How is the process applied?
    • Where does the process begin and where does it end?

2. Customers, their needs and requirements
    • Who are the process customers and stakeholders?
    • How do they use the output of the process, and what kind of requirements do they set?

3. Objective
    • What is the objective of the process?
    • What are the success-factors in the process?
    • How is the process performance measured?

4. Input, products and services
    • What are the inputs, products/services of the process?
    • How is the information handled?

5. Process chart
    • What are the main things in the process chart?
    • What kind of process chart is needed?

6. Responsibilities
    • What are the relevant roles and teams for the process?
    • What are the main responsibilities and critical decisions of the roles and teams?
    • What are the essential ground rules of the process?

Table 2. Process modeling (Laamanen 2001, 78)

The first step of modeling should clarify to the reader where this process is applied: how it is positioned inside the company. The process can be clarified with the help of e.g. an end product or service, customers or situations. In process thinking it is extremely important to think where does the process begin and where does it end. The second step is to think about the process customer and stake holders, who are they? Each process has several customers, and when thinking about the process in a more extended environment, all the stakeholders can be considered as customers in some way. In the description three to five most important customers should be included. When developing process models it might be hard to map the needs of the process customers. A good way to map down the needs is to find out what the customers are complaining about in order to develop these points so that the customers would be mainly content with the process. All of the wishes and wants cannot be taken into action, but it is relevant to hear the customers' opinions in wide perspective. (Laamanen 2001, 89)

In the third step of the modeling it should be explained what is the process's role in the success of the whole company. The goals of the process can be approached from two perspectives: from

a strategic point of view and from the system's perspective. How is the process aligned with the company's strategy? Ideally the objective of the process can be captured in the process name. Success-factors of the process can be e.g. know-how, technology, speed, volume, low costs, process phases, working methods or close relationship with the customers. The challenge is to attach these success-factors to the process in a comprehensive way. In order to measure the performance of the process, there have to be named certain key performance indicators (KPI). When measuring the KPIs it is easier to understand the causal connection, and concentrate on the critical factors for the core performance of the process. (Laamanen 2001, 90-91)

The fourth step of defining the inputs, products and services of the process might be the easiest task as it is very concrete. The similar approach is also considered in the SIPOC model where the process supplier, input, process, output and customer are mapped. In SIPOC model the process can still be described on a very general level. Once the previous steps are carried through, you can proceed making the actual process chart. With help of the four previous steps it is more convenient to understand what are the critical parts in the process. (Arcidiacono et al. 2012, 13; Laamanen 2001, 92)

In the last step of the modeling the responsibilities are defined i.e. what people do in the process. In the flow chart there can be a specific role or a team depending how the responsibilities are divided in the process. For example a sales person can do low value quotations but higher quotations have to be accepted by the sales manager. The process ground rules should be thus mapped as well. (Laamanen 2001, 93-94)

One of the most difficult things to think about when mapping the processes, is that how detailed should the process chart be? The recommendation is that it should be detailed enough for understanding the process logic. Thus not all of the sub-processes have to be included in the process chart. Human's ability to perceive actions is somewhere around 15 to 20 actions per flowchart. If there are more actions included, the flowchart becomes too complicated for most people and the flow chart is not helping them at all. (Laamanen 2001, 79-80)

The process flow charts consist of symbols that describe the process. In the table below are listed the most common symbols. The process flow has always a starting point and an ending point. The direction of the process is shown with an arrow that connects the different symbols.

The most important symbols are the process phase symbols that demonstrate process or action. There are also own symbols for sub-processes, documents and data.
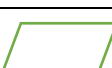
Icons for representation	
⬭	Start/Finish of process
→	Direction of flow
▭	Process phase
◇	Decision object
▯	Sub-process / predefined process
▢	Documents
▱	Data

Table 3. Flow chart symbols (Arcidiacono et al. 2012, 17)

3.3.   *Measuring process performance*

Economic performance is followed strictly in many companies. There are information systems that can show in real time what is happening but many companies are lacking the information why things happen. Economic performance is the result of either external factors or internal process performance. In order to improve anything, the measuring system has to be created. With the help of measuring performance and other factors, also predicting becomes easier. Performance means that organization, unit, process, product or person is provably able to act appropriately (Laamanen 2005, 18). Most of the predictions are based on history of the same function. According to Laamanen (2001, 152) the purpose of measuring performance is to develop the company's productivity. He also discusses economic governance being important part of performance measurement on a general level in companies. Similarly, Sardana (2008, 31-32) presents in his article that effective performance measurement supports valid decision making and taking actions accordingly as there is quantified information about the efficiency and effectiveness. He also discusses the viewpoint on organizational performance: in terms of value it can be seen how the organization creates value using the assets, and in comparison how the owners of these assets expect to gain value. There is interest in how the actual performance

differs from the expectations. Using financial measures as indicators of performance is based on the fact that the real aim of an economic venture is to make profit and give in return dividends to the investors. Laamanen (2001, 152) describes performance as the ability to achieve wanted results. The measures chosen for measuring performance can be e.g. profitability and costs. Measuring is needed in organizations in order to have real facts behind the decision making instead of trusting on opinions and intuition.

Resistance for measuring can result from the personnel's inability to understand the figures. Figures of median, standard deviation, dispersion, probability, validness, correlation etc. might not be familiar to everyone, and thus they are not utilized in decision making. Another reason for resistance might be that people do not want their actions to be under objective evaluation. Measuring results reveals if the organization is not working efficiently. (Laamanen 2001, 149-150) However, some issues might be undiscovered in the measuring such as how many customers were lost last week or how much can be improved in know-how. Performance indicators tell something about the reality, but the exploitation of the measurement results is highly dependent on people's interpretation and how it is combined to other knowledge over the business. Another risk is that numeric data can be easily manipulated. The simplest way to manipulate numeric data interpretation is choosing scale in the wanted way as presented in figure 5. In both of the graphs the same numeric data is presented, but the scales are different. This way the amplitude seems to be much higher in the graph on the right hand side. Another way to manipulate the results is to leave out certain measurement results from the report. (Laamanen 2001, 150-151)
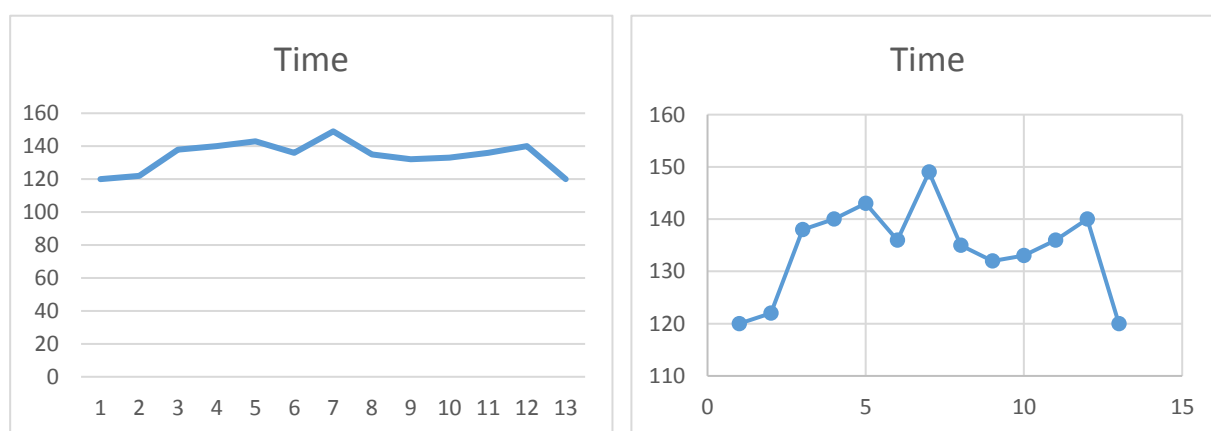
Figure 4. Choosing the measurement scale (Laamanen 2001, 151)

Process performance can be measured in terms of time, money, volume, physical characteristics and stakeholder satisfaction. Lead time is one of the most common process performance indicators. It has been discovered that shorter lead time tends to equal to lower costs and higher quality (less mistakes, customer satisfaction is higher and reaction speed grows). (Laamanen 2001, 152-153) However, also general process improvement can be done by cutting certain process steps or by adding automation. Another widely used time related indictor is delivery accuracy. Many customers appreciate delivery accuracy higher than the short lead time. Then again, short lead time facilitates more accurate prediction of delivery. (Laamanen 2001, 153-154) Yet, general customer or employee satisfaction surveys cannot be used as measure of process performance, as they measure the whole organization's performance. The most reliable way to research stakeholder's satisfaction related to processes is to survey a certain event in a rather short time period. (Laamanen 2001, 156)

When talking about money as a performance indicator, it is mostly considered as process related costs. However, it might be difficult to allocate costs to a single process, as there might be multiple interrelated processes. Laamanen (2001, 156) identifies also other problems such as maintaining the measure system's accuracy, objectivity of the measurer and changes in the business environment.

The benefits of measuring lie in the information gained and how it is utilized. Laamanen (2005, 24) describes the benefits as following:

1. Understanding changes in business environment
2. Balanced planning of actions
3. Analyzing the efficiency of actions for decision making
4. Effective communications about decisions
5. Empowering, delegation and control
6. Following performance and reacting to it
7. Legitimate and invigorating recompensing
8. Efficient implementation of development projects
9. Achieving changes
10. Organizational learning
11. Convincing customers and owners

First of all the information that measuring has enabled can be related to e.g. customers, competitors, the society, technology and actions of the investors. Usually the big changes are not hard to identify even without measuring, but changes that come in slowly might be. One example might be that if the competitors are developing their business faster, it is important to realize the competitor's development in order to face the competition in a timely manner. Those organizations who follow the changes in business environment can exploit new opportunities and tackle the possible threats. Different stakeholders such as customer, owner and personnel have different needs concerning the organization's operations. It is the job of the managers to create a balanced strategy and action plan that satisfy these different needs. This means that there have to be trade-offs so that everybody benefits from the organization's operations more than in some other scenario. Measuring helps in making these decisions visible and in having conversation with different stakeholders. (Laamanen 2005, 24)

Efficiency is one of the most important things for a company's success. Once the initial decisions about the company's strategy and vison are done, efficiency can be accomplished by first taking the step of measuring the performance and analyzing the critical factors affecting to it. The reaction to inefficiencies has to be appropriate. However, companies should question the setting of goals: is it enough just to improve from the previous year or should the ambitions aim higher. (Laamanen 2005, 25)

Employees' commitment to the work does not always show in the results. The reason behind the substandard performance might be insufficient communication about the objectives and execution. The truth might be that there are no real goals or that the goals are in contradiction with each other. The goals might be presented in a way that there is room for individual interpretation, but numeric goals give very little to interpret. The dream of every manager is that employees are competent, reliable, excited about their job and have initiative. The fact that there is no reliable information available about the organization's performance does not support these employees' work. There has to be information what is happening in the organization in order to achieve and maintain efficiency. (Laamanen 2005, 25-26) Knowledge is becoming a more and more important factor in gaining sustainable competitive advantage. Integrating knowledge into business processes and products or services has major positive influence in achieving superior performance. (Sin et. al 2015, 107)

3.4.   *Process analysis*

By analyzing the processes it is easier to understand where the inefficiencies stem from, how they could be adjusted and improved (Rasha & Rasha 2013, 579-580). Many of the business process management (BPM) models seek to improve the processes by making them faster and cheaper. Also business process re-engineering (BPR) and business process improvement (BPI) strive for higher efficiency and effectiveness. The difference between these two is that BPR is more of a radical approach whereas BPI focuses on more incremental changes (Zellner 2011, 204).

Minimizing the risks in processes is one of the key factors enabling organizations' success. Thus analyzing the processes in terms of risks and how to control them is very important. Risk management is remarkable part of an organizations' corporate governance practices and principles. The purpose of risk management is to identify and control the risks that are possibly threatening organization's action. Also risk management can be considered as its own process of identifying, measuring, analyzing and taking action. (Laamanen & Tinnilä 2009, 27)

Risks can be divided into strategic and operational. Strategic risks are related to e.g. the organization's position in the markets, competitors' actions, relationships and social development. Operational risks include e.g. processes, products and services, reporting, authorizations, IT security and critical know-how. Risk management is analyzing the probability of risks occurring and effects it may have. (Laamanen & Tinnilä 2009, 27)

There are multiple ways to analyze risks, but one of the oldest systematic way is Failure Mode and Effect Analysis tool (FMEA). FMEA is usually created within an Excel spreadsheet to help discovering what the possible failure with a process or product is. Moreover, it is important to understand how this failure might affect other functions, what the possible reason for the failure is and how likely the failure is going to be happening and noticed. FMEA is utilized in many business fields, and the benefit is seen in being able to anticipate failures which can be reacted to beforehand. (Sharma et. al 2005, 987)

The factors reflected in failure mode and effect analysis for risk assessment are frequency of failure occurring, severity of the failure and detectability of the failure. In the figure below is

presented the steps of FMEA-tool that starts with identifying the process to be analyzed. The process has to be divided into sections, and after that the possible failure modes have to be identified for each section. When mapping the possible failure modes it is helpful to think about the sections in terms of inputs and outputs: what inputs are required for success and what would compromise the output. Once the failure modes have been determined, then the possible effects of these failures have to be listed. In the next phase the current control methods are mapped: how are the failures prevented from happening and how likely are they detected? The formula in the Excel file calculates the risk priority number. The risk priority number is based on the ranking on severity, occurrence and detection. The highest rank in risk priority should be reacted to first: what are the corrective actions. (Sharma et. al 2005, 988)
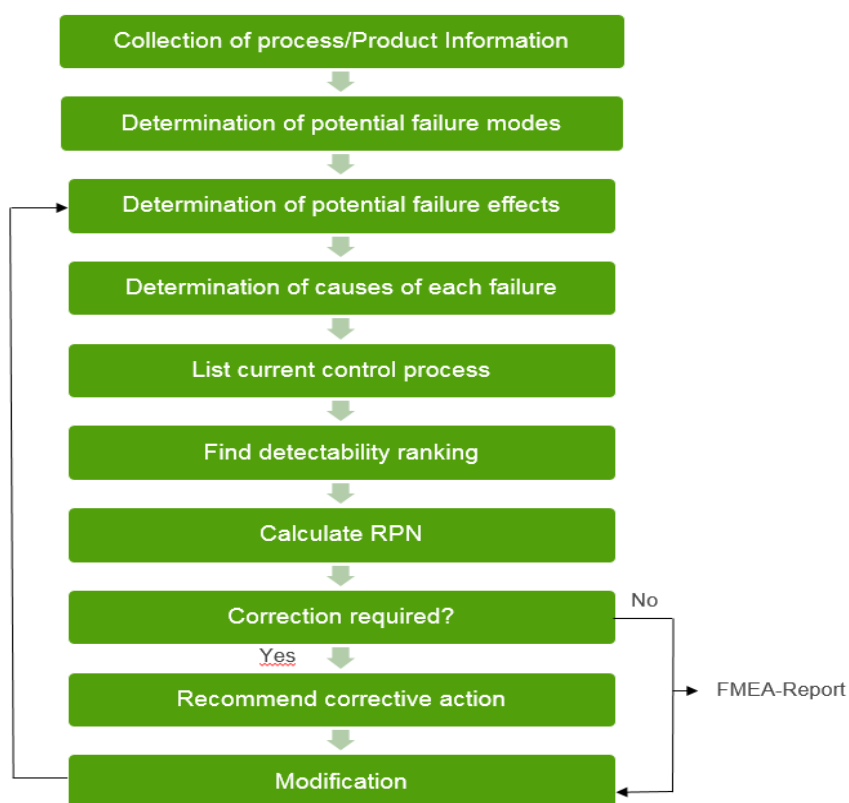
Figure 6. Failure Mode and Effect Analysis process (Sharma et. al 2005, 988)

Below is presented the Excel tool for FMEA. The table should be filled starting from the left as described in the FMEA-tool steps. The evaluation in the scale from one to ten in severity (SEV), occurrence (OCC) and detection (DET) are multiplied to calculate the risk priority. The maximum risk priority number is 1000, and those process steps with the highest risk

priority number must be reacted to first. However, the tool is trusting a lot on the user's ability to analyze the process and possible risks in it. Therefore, the user of FMEA-tool has to know the process thoroughly in order to utilize the tool fully.

Process: XXX

SEV= How big impact does the failure have on process customer?

OCC= How often does the failure happen?

DET= How likely is the failure detected?

RPN= Risk priority number, to arrange the risks in the order of severity

Process step	Potential failure mode	Potential failure effects	SEV	Potential causes	OCC	Current process controls	DET	RPN	Actions recommended
What is the step?	In what ways can the step go wrong?	What is the impact of the failure?	10	What causes the step to go wrong?	10	What are the existing controls?	10	**1000**	What are the actions for reducing the occurrence of the cause or for improving its detection?

Table 4. FMEA tool in Excel spreadsheet (Sharma et. al 2005, 990)

3.5.   *Process improvement*

Process improvement is a result of designed development work. Process development can be approached either as a social change from human perspective or technical change from the system perspective. Both of these approaches are needed in comprehensive development. Improving can be divided into reactive, proactive and innovative improving. Reactive improving is done when somebody notices the issue and implements a corrective action. An example of reactive improving can be when customer satisfaction measurement reveals lower satisfaction level than it would ideally be, and the company reacts to it by trying to reach higher customer satisfaction by offering extra service for free. (Laamanen 2001, 205-209; Muralidharan 2015, 427)

Proactive improving anticipates the future trends and predicts the future. In an organization proactive improving can try to foresee the change of customer needs or competitor's actions. Innovative improving tries to look for entirely new solutions and it can be done with both small and big issues. Often radical improving works better than small scale improving; higher aims usually result as higher results as well. However, more radical changes have bigger risks in

failing than small scale changes. (Laamanen 2001, 206) Muralidharan (2015, 11) sees the process improvement in identifying the eight dimensions of quality: 1) performance, 2) reliability, 3) durability, 4) serviceability, 5) aesthetics, 6) features, 7) perceived quality and 8) conformance to standards. By developing these factors, ideally the productivity of processes will increase and costs will be reduced.

According to Ould (2005) there are three types of process improvement: 1) restructuring roles and interactions, 2) flow-wise improvements and 3) point-wise improvements. The first type of improvement means improving the process by developing the roles and interactions to a better functioning direction by adding them, removing them or combining them. The second type of improvement focuses on the action flow in a process or between several processes. These actions can be rerouted or streamlined. Lastly, with point-wise improvement the changes are done in certain points of the diagram to enhance efficiency.

3.5.1 Benchmarking

Benchmarking is a tool for improvement that applies formalized and disciplined ways of searching success. The objective is to close the gap between the level the company is currently performing and the superior level of performance. The use of benchmarking has increased in the growing competitive pressures (Passos & Haddad 2013, 577) Benchmarking has several definitions. Ford has described benchmarking as an organized method for learning from others and then using that information. (Pulat 1994, 37) All in all, benchmarking can be seen as a continuous process of P-D-C-A: plan, do, check and act as presented in the figure 6 below.
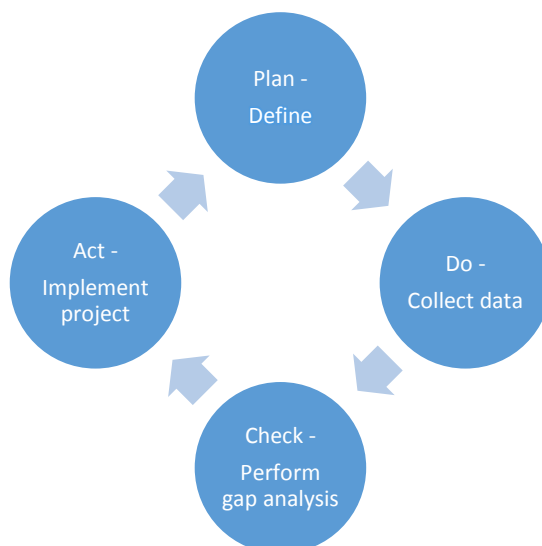
Figure 6. Benchmarking cycle (Pulat 1994, 38)

Benchmarking has also been strongly attached to the idea that it should only be done against the toughest competition or the top companies in the world. The problem is that why would such a company give the information to anyone? Shouldn't they try to keep it as their own information in order to maintain the competitive edge? In the past there have been benchmarking cases where the information is shared because the two companies are not involved in a competitive business. However, in multinational corporations there might also be internal benchmarking-opportunities; inside a big company the practices can vary from one business line or unit to another.

There are different types of benchmarking that can be divided according to what is benchmarked and whom/what it is benchmarked to. Benchmarking has been commonly used for customer satisfaction, financial savings, productivity and operational improvements. Passos & Haddad (2013, 578) divide the benchmarking into four types based on what is benchmarked: performance benchmarking, process benchmarking, product benchmarking and strategic benchmarking. In performance benchmarking the company seeks for benchmarking opportunities that have higher performance levels. The performance can be measured in multiple ways as was mentioned before in chapter 3.3. In process benchmarking the company compares the processes with internal or external partners. Process benchmarking requires process mapping in order to understand the key elements, and what can actually be benchmarked from the partner's process. With product benchmarking the physical products can

be disassembled to identify new materials and technologies. Also with services the whole process can be disassembled to pieces that together create the service experience for a customer. Lastly, strategic benchmarking seeks for enhancements in strategic decisions concerning investments, resources and markets.

In figure 8 the different options for benchmarking partners are presented. A company can decide to look for benchmarking opportunities internally or externally. External players that can be benchmarked include customers that can reflect the relationship with the company's competitors as well. Non-competitors can be willing to give some kind of information about their best practices, but the sensitive issues are not handed over to anyone who is not working in the company. Suppliers can also be one option for benchmarking and they might also benefit themselves. In case the processes are synchronized on a high level, the co-operation with these two parties can become more efficient. (Passos & Haddad 2013, 577; Pulat 1994, 39)
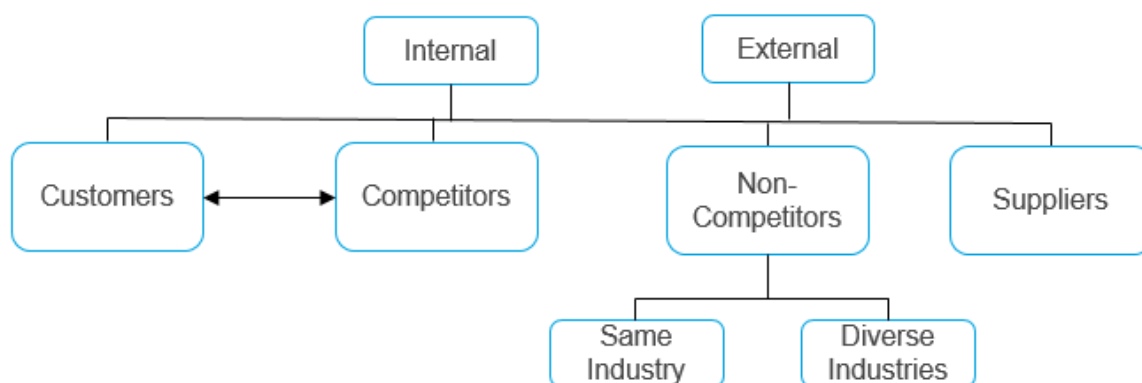
Figure 7. Benchmarking opportunities (Pulat 1994, 40)

3.5.2 Value in process

Porter introduced the term value chain as series of value-adding activities. Value networks have a greater number of dimensions than chains: value network participants are specialized in their own task and thus produce value more effectively with the help of value network. The purpose of a company is to create value for its customers with products and services, and capture the value from its outputs to the company and company owners. (Laamanen & Tinnilä 2009, 17) To fully understand different value streams it is needed to map the intercompany processes. With value-adding processes the value of the final product or service is perceived higher in the

eyes of the end customer than it otherwise would have been. (Hines & Rich 1997, 46) These activities consist of primary activities and secondary activities that support the primary ones. (Fearne et al. 2011, 575) The activities that add value are seen crucial whereas non value creating steps can be considered disposable. The type of value can be divided into user value (UV) and exchange value (EV). User value comes from the properties of product and service that bring utility. User value can be divided into human related and non- human related. Human input would be e.g. certain activity or service, and separable inputs would be e.g. components such as steel or copper in a production process. Exchange value is a monetary amount that is exchanged between two parties doing business. User value is converted into exchange value again when doing business with another party. (Bowman & Ambrosini 2010, 496)

Value chain analysis (VCA) is a tool for analyzing the current and new strategic chances for creating partner and customer value (Walters & Rainbird 2007, 597). According to Soosay et al. (2012, 69-70) value chain analysis focuses on three main issues: 1) information flow 2) creation and flow of value and 3) the nature of relationships. The information flow is evaluated in terms of transparency, responsiveness and inclusiveness from final consumption to production and input suppliers. The second issue concerns the way how customer/consumer sees the value creation at each step of the value chain. Lastly, the relationships between the stakeholders are evaluated in terms of e.g. trust, communication, commitment and risk sharing.

Value stream management is a comprehensive method for managing all potential aspects of value creation to the customer (Charron et al. 2015, 248). Mapping these value streams makes them easier to recognize and analyze further. Forno et al. (2014, 779) describe value stream mapping as a tool for identifying value-adding activities and also activities considered wasteful. There are several tools for value stream mapping with different kinds of views how to capture the highest added value in the company. One of the goals of value stream mapping is waste removal inside companies that means identifying waste in single value streams and then minimizing or deleting this waste. This model was introduced by Toyota and the focus was originally more on productivity than quality. By gaining higher productivity the processes will become leaner and the waste and quality problems can be minimized even more. (Hines & Rich 1997, 46) As well as Forno et al. and Hines & Rich, many theorists divide process factors into non-value adding and value adding. However, Hines and Rich divide non-value adding factors into two parts: non-value adding and necessary but non-value adding. All in all, there are three different types of process steps or processes according to their value adding ability:

1) non-value adding (NVA)

2) necessary but non-value adding (NNVA); and

3) value-adding (VA)

The non-value adding process or process step is considered as pure waste that should be eliminated completely. These factors could be eliminated without degrading the business in any way (Charron et. al 2015, 244). Examples of non-value adding operations are waiting time and double handling. Necessary but non-value adding factors can be considered as waste, but they are necessary for the process to succeed. Still, value adding functions are the core of value creation in a company. (Hines & Rich 1997, 47) These functions should be as efficient as possible to deliver the highest possible value.

Non value adding factors in processes can also be considered through the concept of seven wastes. Charron et al. (2015, 243) define waste as an activity that the customer is not willing to pay for. The ideology was also originally introduced by Toyota for their manufacturing processes. (Hines & Rich 1997, 47) The seven wastes defined by Toyota are: 1) overproduction, 2) waiting, 3) transport, 4) inappropriate processing, 5) unnecessary inventory, 6) unnecessary motion and 7) defects. Charron et al. (2015, 243) also recognize the waste of underutilized employees. By eliminating these wastes the value adding steps should be linked seamlessly together in order to reach the ideal continuous flow in the process. As the wastes described by Toyota are identified in manufacturing context, this model can be developed further to describe the seven wastes in processes as well. The renamed seven wastes are the following: 1) faster-than-necessary phase, 2) waiting, 3) conveyance, 4) processing, 5) excess work, 6) unnecessary motion and 7) correction of mistakes.

3.6. Business process controls

When the improvement points in processes have been identified, the improvements still have to be implemented. It is also important that the critical process inputs and outputs are controlled and monitored. Sin et al. (2015, 105) state that in the control phase procedures are documented, employees are trained for new processes, and there are created monitoring and reaction plans for the enhanced processes. According to six sigma ideology all of the defects occurring in processes stem from variation. Therefore, in order to enhance processes, it is essential to

minimize the variation. Process control tools can measure the variation in a statistical way, in order to see the scale. Control charts help in tracking performance over a certain time period, evaluating results after process changes/improvements, and detecting process variation. However, this kind of statistical tool is more suited for manufacturing process development where no radical change is needed. (Muralidharan 2015, 427)

In order to steer the organization appropriately, managers have to control the functions inside the company. Management control systems are tools that help in directing the company in line with the strategic objectives. Management control systems are not only used to see how the outcomes are compared to the objectives, but also to predict the future and map the current threats that compromise the company's strategy. (Simons 1990, 127) Ratliff et al. (1998, 102) divide controls into five groups: feedforward controls, initiation controls, positive process controls, protective process controls and feedback controls. Feedforward controls, such as monthly planning, prepare the business process for required action in a proactive manner. Initiation controls steer the right activity to be started at the right time such as the purchase of raw material when the stock is running low. Positive process controls direct the process's operating objectives e.g. makes work easier in a system or guides the material flow to the right direction. Protective process controls prevent and correct wrong things from happening. A good example from protective controls is that in ERP-system there is a notification of a missing information on a sales order. Feedback controls are needed for monitoring the process performance and how the performance can be maintained on a certain level.

3.7. *Theoretical framework*

In the figure below the theoretical framework is illustrated. This research is done in the context of RCP business. Recovered paper is an important raw material in new paper production as it is cheaper than virgin fibers and requires less processing. However, the sourcing of RCP varies in different countries due to different waste management approaches. In Finland the segregation of paper and board is done at source, where as in other countries only small portion is segregated at source and rest of the material has to be sorted in a material recovery facility. As RCP is cheaper than virgin fibers and requires less processing, also the demand is great. In Finland for example there is greater demand of RCP than there is supply. Thus securing the flow of RCP requires different sourcing approach than normal virgin raw material sourcing would imply. As

a result of sourcing RCP there can also come by-products. These by-products can come as a by-product from the sorting or just be included as part of the sourcing contract. In order to support the ideology of closed loop material flow where waste is seen as a resource, the material should be utilized again. Materials that one company cannot utilize in its production are sold further for refining, but the fluctuations in raw material prices and costs of sorting can negatively affect to the profitability.

Businesses consist of processes that coordinate resources, system and data in order to meet the customer requirements. The processes can be divided in multiple ways, but generally there can be detected the division to main and sub-processes. As the RCP organization's main task is to source RCP, not to sell it, the sales function should be as efficient as possible. Efficiency can be perceived in terms of time and costs, but also value creation is in consensus. The process steps that do not create any value and are not necessary for the process should be discarded. Still, it should not be forgotten that systems bring possibilities as well as limitations to the processes: what might work well as an idea in real life does not always fit to the system's logic of functioning.

The process improvement can be approached with the well-known improvement cycle of DMAIC: define, measure, analyze, improve and control. In process improvement the first step is to map the processes that require improvement. The objective of process mapping is to describe the process to recognize critical points: both value adding and not value adding activities. In the second phase the process performance should be evaluated. However, if the process improvement is not just about shortening the lead time etc. the measurement does not give big significance to the improvement. For example, if the improvement focus is on adding more control or synchronizing the processes within a company, the focus is off from numeric measuring of performance. Nevertheless, there should be accurate information how certain functions affect to the company's results. In the case of RCP there should be detailed accurate information how the sales function works.

The next phase is to analyze the processes. Failure mode and effect analysis tool is a systematic way of analyzing risks and their consequences. This tool helps in calculating the risk priority number: the process step with the highest risk priority number should be reacted to first. Still, the problem of how the improvement should actually be done has to be considered case by case.

One of the most common tools is benchmarking which applies formalized and disciplined ways of searching success either internally or externally. In big corporations the best practices can be found inside the company, and it is easier to benchmark internally on sensitive issues that are tied to the competitive edge. Also value stream mapping has been widely used to recognize the value adding and non-value adding activities. This way the waste i.e. not needed steps or phases can be cut off.

The last phase of the improvement cycle is control. It is important that he improved procedures are documented, employees are trained for new processes, and there are created monitoring and reaction plans. The last phase is as important as all of the previous phases in improvement process, and it has to be completed properly.

Figure 8. Theoretical framework

4.   Research methods

This chapter explains how the research project proceeded. Firstly, we look into qualitative research characteristics, then the actual research process and lastly the reliability and validity of this research.

4.1.   Qualitative research

The empirical part of this thesis is based on qualitative research and it is done as a single case study in the paper industry. Hirsjärvi et al. (2007, 159-161) describe qualitative research as comprehensive way of gaining information where the researcher relies on observation and discussion to reveal unexpected matters. Besides discussion and observation, in this research there were also learning sessions, workshop and internal files as a data source.

Cooper and Schindler (2010, 168) state interview being the primary data collection technique in qualitative research. In this research the chosen interview method was semi-structured interview because with this method there is flexibility with the questions for both the interviewer as well as for the interviewee (Tilastokeskus 2016). The interviewer's subjectivity was considered in the interview by not trying to influence the interviewee's answers and by creating questions that are not leading. Still, there were performed additional questions if some aspect was unclear. Also, the author tried to build free discussion beside the interviews to find out issues that might not be acknowledged.

The objective of a case study is to get multiple perspectives of a single case or several cases at this point of time or over a period of time (Cooper & Schindler 2010, 181). This thesis can be considered single case study at the current time. The objective is to collect and analyze qualitative data with the intention of gaining comprehensive view on a single case.

4.2.   Research process

The research was done for a commissioning company that had the research topic ready. The thesis contract was signed for 6,5 months starting in January 2016 and ending in July 2016. The location for the work was set Lappeenranta, but the project would also include travelling to the other business units in France, UK and Germany. The research project started with trips to the

head-office of RCP organization in Germany and to UK where most of the RCP sales happens. It was very important first to get to know the RCP business, and understand how the value chain around RCP is formed. The first four weeks of the project were thus used in getting familiar with the business, the processes and the current reporting. In Germany there were arranged learning sessions to get an idea how the processes are done in Central-Europe, which is the biggest operation unit of the RCP organization. The learning sessions were performed together with the process expert, in a way that there was shown certain issues related to the processes, but also so that the author had the chance to test the processes in SAP test environment by following the test descriptions. These sessions were performed in Germany 2 times, and lasted approximately 2,5 h each. The test descriptions and notes done in the test sessions were utilized as a guideline when analyzing the process flow in SAP. The author's earlier experience with SAP was of great help when getting familiar with Company's functions in the system.

It was also important to build the scope for the master's thesis from the beginning: what issues were relevant and which were not included in the research scope. The initial meetings with the company representatives worked as a basis for the scope and it was included in the research plan. As the topic was given ready, the task of formulating the research question and the sub-questions comprehensively was easy. The written research plan that included the background information, scope, research questions, research method, brief literary review and preliminary table of content was approved by the company's thesis supervisor. There were also meetings with other RCP organization's employees, in order to see how the project proceeds and are all of the facts clear.

In order to be able to answer the research questions, the research method was chosen as qualitative. Once the research question and the sub-questions were approved by the commissioning company, the planning of the interviews could be started. Also discussion with the university's thesis supervisor guided the project further. The interviews were performed between March and May 2016. The group of interviewees consisted of relevant personnel in the RCP organization, Finance team and also other lines of business for benchmarking purposes. RCP organization's Process Expert was supporting in all SAP-related questions during the research project. Also, some of the facts and ideas had to be consulted with the Company thesis supervisor and other relevant RCP personnel, as the topic was connected to a wider scope than the actual research. There was also one workshop related to alternative reporting tools that the researcher attended to. In the workshop there were both lecture and

hands-on part. The researcher made notes in the workshop about the upcoming issues that were not revealed earlier, and observed some of the functions this software entails.

All in all, there were made 10 interviews. The interviewees included personnel from all of the business units to get a holistic view. The roles of the interviewees included 2 order handlers, 3 business control professionals, 1 sales manager, 2 sourcing persons, 1 process expert and 1 contract review manager. In addition, there were open discussions with several people from the RCP organization as well as from other business lines for benchmarking purposes. These conversations were useful in getting familiar with the RCP business and the special characteristics it has compared to other sourcing functions.

 The interview could be divided into three themes that were reflected from the research sub-questions:

-Current processes
-Development points
-Reporting

The interview questions were altered depending on the role of the interviewee. The interviewees were informed about the themes with an e-mail few days before. In the benchmarking interviews the themes were current processes and reporting. The benchmarking interviews tried to seek into the other business line's processes as well as reporting. However, as there are quite big differences between business lines, it was important to understand the context where this process works i.e. what is the main process and what are the sub-processes.

The interviews were performed face-to-face in a negotiation room or the person's own room for getting privacy. Most of the interviews were recorded and transcribed, and for some of the interviews just notes were made, as the main data was shown in documents by the interviewee. The interviews which were planned to investigate the benchmarking opportunities included documents from the ideally benchmarked business unit. The documents included such things as sales reports, SAP data files and sales process flowcharts.

Learning sessions and interviewing the relevant people helped in mapping the current processes in flow charts. The relevant people interviewed for mapping the processes were the process expert of RCP organization, sales manager and order handlers. There were also brief discussions to double check if all of the important process steps were taken in consideration. The processes were mapped with Microsoft Visio as that is the program the case company has been using earlier to make the process flow charts. The process flow charts were then delivered to the credit risk management team for their project of developing credit risk management in RCP sales.

For the enhanced process descriptions the benchmarks from Company other business lines were utilized. The decision to benchmark internally against wood sourcing is based on the similarity of the business: also in wood sourcing there is sales of excess sourced material. Also, the wood sourcing and sales is more developed and has the required control over different phases. The decision to benchmark against paper business was based on the fact that paper is the main business of Company, and it has been developed throughout the years. However, it was obvious that not the whole processes could be brought from one business area to another. Only suitable best practices and procedures were recommended to be implemented in the RCP organization.

4.3. Validity and reliability

Evaluating the validity and reliability of a qualitative research is challenging. In interview based research there are multiple interpretators: interviewer, interviewee and the research reader. (Hirsjärvi et al. 2003, 217) Interpretation is also involved in the data analysis and research itself. Research reliability can be estimated based on research methods, research data and research results (Hirsjärvi et al. 2007, 227). Validity and reliability of this research are backed with detailed description how the research process proceeded. Research data was collected via interviewing relevant people and internal data files. The group of interviewees was discussed with the company's thesis supervisor to make sure all of the perspectives were taken in consideration. Once the interviews were recorded and transcribed, the data was analyzed with the help of coding. The coding ensured a systematic analysis of the research results: the topics were divided to certain groups based on the interview themes and already during the research process there were seen certain patterns. For example in the development points questions there were clearly SAP-related development points and then general level process development points. The internal data files were shared by the interviewees or by a person who is in charge

of the function the data files are about. Some of the data files were not up to date, but the changes were corrected in the researcher's own files.

However, this research is done as a single case study in the current time in the paper industry, and the generalization of the research results can be questioned. The specific characteristics of this case study lie in the current processes that have been formed based on power relations, ERP-system and general business requirements. Therefore this information is mainly applicable only to this research case.

5.   Current processes

The processes under development were described by Company to include all of the RCP organization's sales processes. In reality these processes also included other functions, but sales order is utilized in all of these cases to organize money flow correctly. It is important to remember that the main task of the RCP organization is to source recovered paper from household collection and the industry, such as printing houses and label manufacturers. The sales function is thus just to support the main strategy in an efficient way. The information about the processes was collected via interviews of the RCP personnel and credit risk management team. Also company's internal data files were utilized in finding relevant information.

5.1.   Implemented improvements

During the process improvement project, some renewals were already carried through due to the pressure for managing money flows more transparently. The sales groups were defined to start the project of dividing different kinds of sales as: actual sales of RCP, recharges, side flows and gate fee. Recharges can be e.g. charging the vendor for delivering too moist material. Side flow sales means selling of material straight from the third party or from a warehouse that is in the case company's control, e.g. as a part of printing house contracts there is sourced graphic grades and cardboard is sold directly. Lastly comes the gate fee where the case company gets the material and also a payment, which is directed right with the creation of sales order to make the money flow correctly. As the sales groups were developed, the actual sales order approval workflow was taken into usage after a few months the thesis project was started. However, no workflow was created for recharges yet at this point, so the sales group could not be utilized in a proper manner. This was because another more important project was going ahead of this project, and the test environment for SAP processes was in heavy use. The sales approval workflow simply informs the person who should release the sales order after the sales order has been entered and it has been automatically blocked. The person releasing the order gets an e-mail with linkage to SAP, and he can easily check the order details and either release it or keep it blocked for further investigation. Also, if the value of sales order changes it requires re-approval.

The purchasing personnel were named as the persons responsible for releasing gate fee and side flow sales orders, as they are attached to these processes to start with. It is logical that when they source the material from vendors and as a side product there might come materials or grades, they also handle the sales part. When the recharges sales group will be taken into action, the purchasers will be responsible for releasing those sales orders also. For sales from own stock in all markets the person responsible is the sales manager. There was also set an upper limit for all sales orders that requires manager's approval and the Supply Chain team can release the order after approval for further processing. Still, the limit was set high enough that these cases do not normally happen often.

5.2. Current process descriptions

The current process descriptions were built according to the interview data from each business unit. A flow chart was made of each of the business processes. The flowchart also included information how the processes are currently entered into SAP, and how they could possibly be separated from each other in the system. The process descriptions were chosen to be presented more on a general level instead of going into information system details that are already mapped in the company's internal files.

5.2.1. Sales from own stock

Standard sales process from own stock means that the material to be sold is in the possession of the case company at its premises. As RCP organization is mainly a sourcing organization the process starts with sourcing of the material. The sourcing contracts may also include also by-products that have to be sold further such as different grades of paper that cannot be utilized in its own new paper production, carton, different plastics, aluminum and glass. Also, if there has been a shutdown at the mill or for some other reason there is problem in warehousing, also grades that Company would utilize, are sold. The material sold can be in bales or bulk, but in both cases the material is anyhow weighed on Company scales.

In the UK at the MRF the excess sorted materials (by-products) have to be sold in a rather quick phase in order to keep the facility running. The warehousing capacity at the MRF is limited for the sellable materials because only the raw material for new paper production is stored. As the sourced material is a mixture of different components that Company sorts either in its own

sorting facility or in joint ventures, the contract review has to be done in more detailed level. Currently there is in use a cost model that evaluates earnings before interest, taxes, depreciation and amortization (EBITDA), effective price of RCP on EBITDA level and minimum overall contract price to break even among other key figures. This cost model is based on historical and up-to date data. The fact that the cost model is based on historical data concerning e.g. the material composition and average sorting cost per hour lowers the reliability of the model. However, getting up-to date accurate information is very difficult or even impossible in the current situation.

In the UK the trigger for sales comes from the MRF: there are predicted certain amount of materials available for selling next week. The situation is updated by the MRF personnel accordingly if the predictions are not seen to meet the reality. The sales manager checks the solvency of customers on a regular basis to keep up with the situation. In the negotiations the sales price is set for the whole month and also the volumes are discussed. Based on this information the sales manager and the delivery planner then have a meeting about the delivery amounts and customers. The amounts do not vary remarkably from week to week, and it can be quite well predicted that which customer would be willing to buy the material. Still, there are only few sales contracts in place. The sales terms and customer information is then saved in an excel file by the sales manager and forwarded to the order handler who enters the order in SAP. The sales manager is responsible for all RCP standards sales orders from own stock to external customers in UK, CE, France and Finland. He has good knowledge over the market and customer base that helps him finding the possible customers. Therefore active contacting and discussion with current and prospective clients is important. The amount of sales orders vary from one country to another: UK has approximately 20 real sales orders per month, and the total tonnage for it is about 14 000 T. The invoicing of sales orders is done on a weekly basis and it is followed in a excel list. The invoices are printed and sent via mail to the customers.

In France there are approximately 4 real sales order per month, and the tonnage totals 12 000 per month. There are no existing sales contracts as the sales is done according to the situation: what is available and cannot be utilized will be sold. The sales is directed much by the sourcing manager who informs the sales material volume, price, payment term and incoterm via e-mail to the order handling. It is logical that sales is done by a French employee to avoid misunderstandings due to the language, and also negotiations might be more productive once

the language is mutual. The order is then entered to SAP, and the workflow notification is sent automatically for the person responsible. Once the sales order has been released, it is printed and scanned to the customer as an order confirmation. After that depending on the negotiated incoterm, the delivery or pick up is planned by the delivery planner together with the customer. With the help of globally recognized incoterms the misperception regarding obligations and costs of the buyer, seller and haulier are cleared. (British Chamber of Commerce 2016)

The invoicing in Company France unit is not done as in other business units because of the local policies. For purchase orders the local authorities do not accept the self-billing, that Company is utilizing in its purchasing function. Self-billing means that instead of the vendor sending Company multiple invoices that would require a lot of handling time, Company already invoices itself i.e. pays the vendor. The invoiced and not invoiced orders are not followed systematically, as there are only few sales orders that have to be invoiced. Still, one sales order can include tens of loads that have to be invoiced per load.

In CE there are 15 real sales orders per month, and the total tonnage per month is about 2 000 T. In CE the sales from own stock is triggered by excess material in stock that has to be sold. There are also contracts with printers to source RCP, and the by-products such as cores and carton board are sold further. For sales from own stock there are no sales contracts as such, but the sales is done according to the excess available material. The sales order details are informed to the order handlers by the sourcing personnel or sales manager. Once the order has been released via workflow, the delivery planner can plan for the delivery time. When the delivery has been completed, the invoice can be created. The invoicing for sales orders is done at the beginning of the next month, and it is sent automatically from the SAP. The invoiced and not invoiced orders are not followed as such by the order handling, but the sales manager and the contract review manager are running a report to see the situation. In the CE there is also the reactive approach towards invoicing; if there are problems with the invoicing it will be informed by the credit risk management-team (CRM).

In general, there are rather seldom new customers, and the existing customers mainly hold the same terms of sales from month to month. There is a weekly report provided by CRM for UK, and monthly for Austria, Germany, Finland and France. The report explains among other things which customers are still open for sales and which customers are not. The credit risk

management interviewee mentioned the term "respectful credit risk management" where they can recommend for not selling to customers that have or are about the go over their credit limit. Still, they cannot ensure that the selling is stopped immediately, but they can ask for blocking the customer in SAP for further sales. The RCP Contract Review Manager receives the request and consults with the sales manager before setting the block.

In most sales deals the incoterm stays the same, there are the same items sold and the payment term stays the same. However, if there is a new customer, there has to be done certain procedures before the sales can begin. According to the interviews, this process is well defined and in most cases also followed. The possible new customer information is recorded, the duty of care documents are asked for, and the customer information is sent to the CRM team for solvency check. If the customer is meeting the requirements in terms of solvency, duty of care documents are valid and the customer signs the Company code of conduct, the information can be sent further to master data team for setting new customer account in SAP. Also, there has to be set a credit limit for sales that exceeds certain sum.

In the figure 10 is presented the flow chart for the current process of standard sales from own stock. This flow chart is built mainly according to the UK case as it is the biggest sales unit of RCP. However, the SAP related information is the same in all of the business units. The process starts with the excess material that has to be sold, proceeds to the negotiations and the sales information is handed over to the order handling. The order is entered to SAP and set to delivery block automatically. The work flow sends automatic e-mail to the sales manager who can decide to release it or keep it still blocked for further investigation. At this point there can still be done alterations to sales price etc. Once the sales order is ok, and the delivery planner has consulted with the customer about the delivery or pick up, the delivery process proceeds, and the invoice is created. Lastly, the customer receives the invoice and pays it. In case there are problems with the payment even after the notification after the due date, the CRM team will take action. The sales manager is informed about the missing payment, and is advised to contact the customer. If any of this action does not encourage the customer to pay, the CRM will start the collection process.
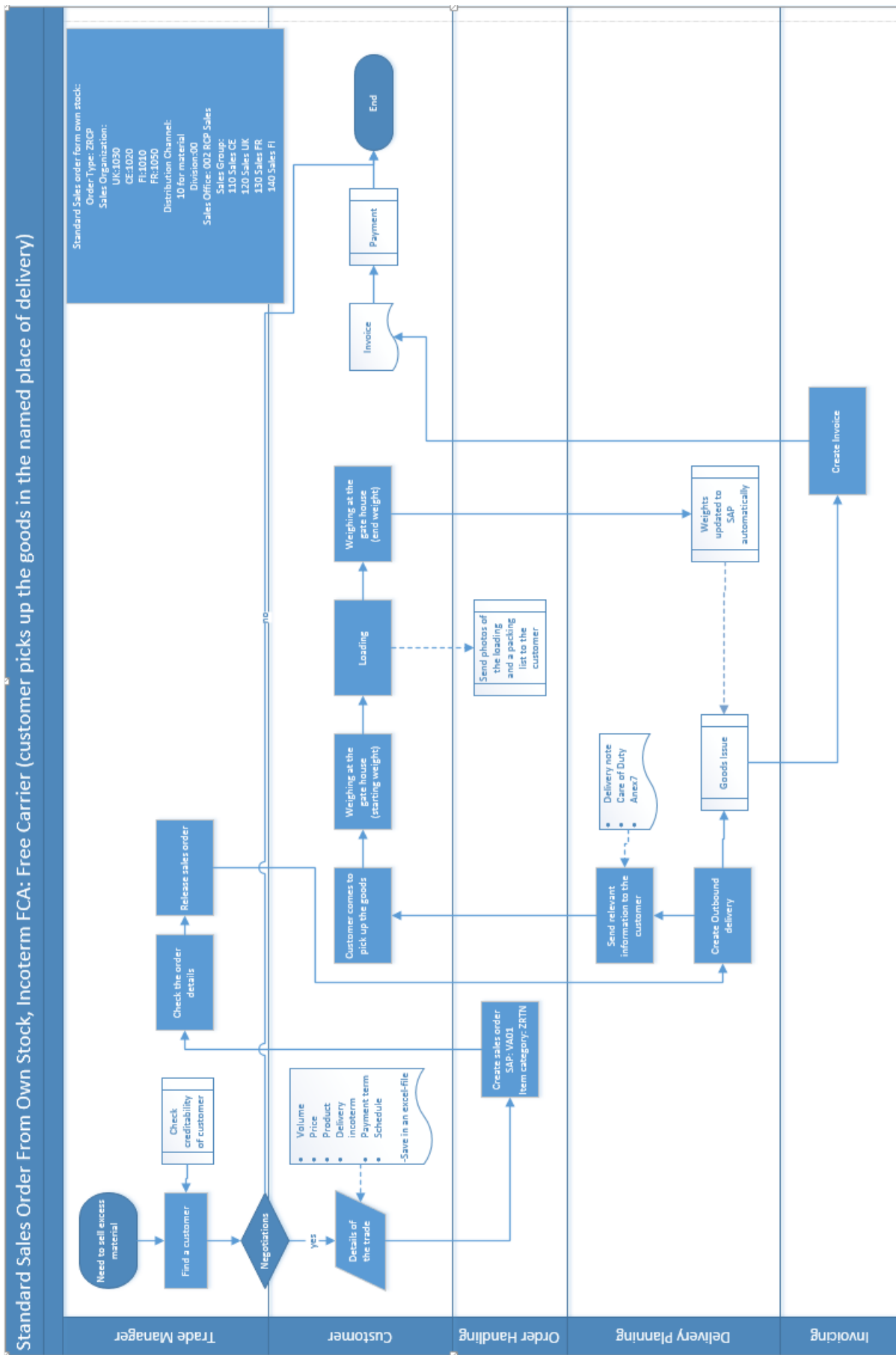
Figure 9. Flowchart of sales from own stock

5.2.2. Third party sales

Third party sales means that the material is sourced from a third party and the material that Company cannot utilize is sold directly to the customer without bringing the material to Company premises. This material can be for example certain grades the commissioning company cannot process. In SAP the sales order (SO) is connected to the purchase order (PO) via requisition number, so the material flow can be tracked from the vendor to the customer. Some of the sourcing contracts oblige Company to source also these materials that have to be sold elsewhere. The third party sales is done mainly by the sourcing personnel, as this sales is tightly connected to the sourcing function. The main process steps of this sales case goes in the beginning very much like in the standard sales from own stock.

There are seldom new customers, and there is a clear process for the new customer opening that requires credit check, compliance with Company business policies and proper setting of customer information in SAP. Once the customer information is in order, the sales order information is informed to the order handler, and the order is entered accordingly. Next, the work flow notification is sent automatically from SAP to the sourcing person responsible, and it can be decided to be released or keep blocked for further investigation. Once the sales order is released there can be formed the delivery note. The delivery note includes such information such delivery site and location, document date, contact information, customer number, sales order number, sales order validity time, delivery period, incoterm, material description, ship-to party, customer reference number, load reference number and vehicle registration number. The relevant documents are sent to the customer via e-mail, and the haulier also gets paper version of the needed documents. The materials are then delivered or they are picked up from the third party according to the determined incoterm. The invoicing person or team at Company posts goods issue and does the invoicing. Posting goods issue in SAP means that you reduce the stock by delivered amount in warehouse. However, in France the third party sales has its own specialty. In France the SO cannot be invoiced before the PO is invoiced. Once the invoice for SO can be created, it is sent via e-mail and mail.

5.2.3. Gate fee process

In the gate fee process Company is sourcing material and gets payment for the intake. This is done in the UK and CE. In the UK the material is commingled waste that Company is contracted to take in. In the purchasing side they are now involving in contracts that can last about 5 years or less. The approach in recent years has changed to engaging in shorter contracts, as the market situation cannot be predicted far in the future. For example in France the market for RCP is slowly changing from the supply of cheap sorted raw material into cheap unsorted raw material. Thus the sorting expenses are about to be transferred to the Company. However, not all sourcing of commingled waste is paid as in some cases Company also pays for the commingled waste to acquire more raw material for new paper production. Commingled waste can have different compositions depending on the segregation at source. There can be only one bin for everything, or separate bins for glass and paper & board. There might also be hazardous waste that is detected at the quality check when the material is delivered to the MRF, and removed before the material proceeds to the sorting phase. At the MRF different materials are sorted from each other with multiple techniques such as magnets and crushing. Company only takes the graphic paper, grade 1.11, from the sorted materials and the rest is sold or disposed of. Other grades of paper cannot be utilized in the mill. In CE the gate fee material is mainly label materials that breweries supply to Company. The labels have to be de-siliconized in order to be used again, and the technology for this function is only available in one facility in CE.

5.2.4. Reverse gate fee process

Reverse gate fee process means that Company has to pay third party for taking the material. This process is only taken place in the UK at the MRF where as a result of sorting there is left materials that have to be disposed of. There are several trucks coming each day to pick up the materials without any further notice of material being available at the MRF.

The order handler enters the sales order into SAP with a small price that will be written off automatically during the night. The point of creating the sales order in the first place is to be able to create tickets against which the trucks can come a get a load of residuals. Then the truck comes in and is weighed at the gate house, loaded and weighed again when leaving to get the net weight. Once the pickup has been done the weighing confirmations are printed out. These

weighing confirmations are collected for the day and delivered to the office house. The quantities are taken from the weighing confirmations and are entered into a service purchase order, which will be then self-billed. The fact that the work is done a lot in manual increases the workload and also increases the risk of data inaccuracy. This process did not exist when the ERP-system was taken into usage, so the process was built simply to organize the money flows and create tickets.

5.2.5. Recharges

Recharges are not real sales, but they are done with the help of sales order in order to make the money flow correct. The recharges are done when the purchased material e.g. mixed paper from a printing house is too moist. The same SAP process is carried through if the Company charges for a service that they have supplied to a customer/vendor. Company makes a sales order for the material in order to get money back from the vendor i.e. correct the money flow between Company and the vendor. Company's logic in claim handling in the RCP sourcing differs from other business lines inside the company. In RCP when there is detected a quality problem with the purchased material, the issue is agreed with the vendor, and Company does a debit note to the vendor. The process has been arranged like this because sales orders are easy to track and follow-up is evident: if the vendor does not pay the invoice, it will appear in the CRM team's report, and the collection will be enforced if needed. Also, the power relations between Company and vendors and customers affect to the process formulation. As Company has lower power relation in relation to the vendor, they take care of the processes which would be many times the vendor's responsibility. The current power relation is due to the limited amount of raw materials in the market. Currently the service sales orders are not followed in the RCP organization.

5.2.6. Intercompany sales

Intercompany sales means sales between two units which have different company codes. The units have an existing intercompany contract that sets the terms. The material flows in Company intercompany sales are directed mainly from UK and France to Central-Europe and from Russia to Finland. This process has been working well, as it is very straightforward and there is control

via intercompany contracts. However, intercompany sales is also included in the sales reporting, and it should be able to separate this kind of sales from real sales.

5.2.7. Crediting process

Company credits the customer in cases there has been a breakage of agreed terms on Company's side e.g. price correction or the material was not ready for pick up when agreed. The crediting process is triggered in most cases by the customer who informs about the occurred inconsistency. Customers usually contact to the order handling via e-mail, who ask for approval from the sales manager or then they contact the sales manager straight. In the CE and France the crediting is investigated by the person responsible for making that sales deal e.g. in cases of side flow sales the person responsible is the sourcing manager.

5.3.   Differences between countries

One of the goals in RCP organization is to unify the processes as far as possible. However, currently there are differences in how these processes are carried through. Some of the differing are because of legislation, infrastructure for collecting the RCP and lack of control. One major factor has also been that as the focus has earlier been on synchronizing the sourcing processes, that sales processes have been of less importance and had its free way of formulating. Nevertheless, the system has its own limitations as well: SAP has its own logic of functioning and building new processes in the system can take time.

In Finland the sales of RCP has been a minor business, as most of the material is utilized. The administrative side of RCP sales in Finland is handled in Germany, so Finland is left out of the comparison as it is included as part of the CE order handling. In the table 5 is presented the main characteristics of processes in different business units. Firstly is presented the segregation of duties: The sales manager is responsible for all RCP sales to external customers, but also sourcing personnel have big role in the sales function. In the interview there was discussion about the segregation of duties. There was a feeling that there might be even too much segregation in the beginning of the sales process, where the person doing the sales has to collect the information regarding the sales terms and inform it to the order handler. The sales order could be entered into SAP already in the negotiation point. However, the segregation of duties

helps in adding the control within a team: people have their own roles which they fulfill and no-one can carry through the whole process.

The required documents for sales vary between cases and countries. In the UK there are required duty of care document, packing list and Annex VII if the sales is export. Also, if the sales is export, the bill of lading is needed for ship deliveries. Duty of care documents oblige any entity who handles waste to manage waste safely in order to protect the environment and human health. Packing list has multiple names: waybill, consignment note, shipping list etc. The information needed in the packing list also varies, and it can be agreed in the trade contract. Packing list can include such information as date and place of the consignment, sender and customer information, material description, gross weight, number of packages, type of packages, consignee information and charges related to the carriage. Currently in the UK the packing list is written into an excel file from photos of the loading and SAP information. The photos include the information about the haulier registration number, container seal number and bale count. Rest of the information is collected from the order details in SAP. Information about the container seal number, bale count and haulier registration number is not available in SAP, but ideally it would be in the future. Annex VII is a document that should be provided by the party organizing the transportation. This document can be considered as a contract between the transportation organizing party and the consignee about the obligations of ensuring the recovery or storage of the waste. (European Commission, 2011)

If the sales is between two countries and the transportation is on land, there is needed CMR form (Convention des Marchandises) for the road freight. This has been utilized in the CE unit as there has been sales with other business units as well as suppliers and customers in other countries. The CMR form confirms the carrier's reception of goods in good condition and explains the terms for the international carriage of goods for road freight (British Chambers of Commerce 2016). In all of the business units there is also needed a delivery note. In the UK the delivery planner sends the documents of Annex VII, delivery note and duty of care documents to the customer. The order handler has the responsibility of sending photographic evidence of the loading and packing list to the customer. In the UK all of the loads are photographed even if the customer does not require it. In France and in the CE the loadings are not photographed. In CE the delivery planners take care of the Annex VII, transportation document and CMR. In France there are very seldom cases where they would create Annex VII, as for intercompany sales the documents are provided by CE unit. In the UK, Annex VII is also very seldom in use,

and the SAP-function for this document creation has been disabled due to lacking instructions. In case there will be more sales from UK to abroad in the future, the usage of Annex VII function in SAP should be investigated. In France the documents are mainly handled by the order handler. However, in France the three team members are capable of replacing each other in case there is need.

Standard sales order from own stock, 3rd party sales, recharges, and crediting are processes that are used in all of the business units. The recharges process was not in use in France for a while as the person responsible left the position, but it is utilized currently as the instructions were provided. All in all the processes are functioning in all of the business units, but they could be more efficient and more controlled.

The biggest unit for RCP sales is the UK, and after that comes Central-Europe and France. Although the amount of sales orders is not big, these sales orders can include tens of rows which equal one load per row. Workflow is utilized in all of the business units. However, only in Germany the invoices are sent automatically from SAP. In France and the UK the invoices are sent by mail and e-mail. Still, the UK is the only unit that has some kind of follow up on the invoiced and not invoiced order with an Excel-file.

Action	The United Kingdom	Central-Europe	France
Segregation of duties between:	Sales manager, purchasers, order handler, delivery planning, invoicing	(Sales manager), purchasers, order handlers, delivery planners, invoicing team	Sourcing manager, (sales manager), purchasers, order handler, delivery planner, invoicing person
Document handling/person	• Delivery planner & invoicing person	• Delivery planners	• Order handler
Required documents for sales:	• Delivery note • Duty of care	• Delivery note • Annex VII (export)	• Delivery note • Annex VII (export)

	• Annex VII (if export) • Packing list • Bill of lading (shipping)	• CMR (export)	• CMR (export)
Processes in use	• Standard sales order from own stock • 3rd party sales • Gate Fee • Reverse gate fee • Recharges • Credit Memo	• Standard sales order from own stock • 3rd party sales • Gate Fee • Recharges • Credit Memo	• Standard sales order from own stock • 3rd party sales • Recharges • Credit Memo
Real sales orders per month/tonnage	• 20 orders, 14 000 T	• 15 orders, 2 000 T	• 4 orders, 3 000 T
Photographic documentation	• Yes	• None	• None
Order confirmation	• None	• None	• Yes
Generation of packing list	• Manual	• Not generated	• Not generated
Workflow usage	• Yes	• Yes	• Yes
Invoices sent	• Mail	• Automated e-mail from SAP	• E-mail and mail
Follow-up on invoicing	• Excel follow up in order handling, report taken by the sales manager or contract review manager	• No follow up in order handling, report taken by the sales manager or contract review manager	• No follow up in order handling, report taken by sales manager or contract review manager

Table 5. Process differences between business units

6.   Process development points

The development points described by the order handlers and people who are close to the daily operations identified mainly SAP-related problems. The problems in the wider context in the processes were only described by the managerial level employees. Resolutions for SAP-related problems were firstly compared between different business units in the RCP-organization. Benchmarking from other business lines was possible for general development, but not in a system level. In other business lines there are also other software than SAP in use.

6.1.   System related development points

One of the problems in France on SAP level was the big quantity of invoices. Each load requires its own invoice, and as the invoices are sent both via e-mail and mail, the sending process itself takes a lot of time. The resolution for this issue is automating the sending of invoices from SAP, and maybe even some of the invoicing could be automated. The automation of invoicing also on the sales side would happen once the wanted sales orders in certain time period are released from the billing block and the automation could be taken into action during the first few days of the next month or at any other time wanted. The invoicing would have to be followed, in order to see that none of the orders were left in billing block. In the UK the invoicing is followed in an excel file, but more convenient way would be taking a report that shows the invoice number on an item level, and also if this item has not been invoiced.

In the UK some of the processes included a lot of manual work, and the development points were seen a lot in automating the functions via SAP. Also, the availability of information should be easier. The order handler was calling for information about the container number, seal number and number of bales in SAP. At the moment this information is not available in SAP. In order to reach this information, these numbers should be either typed or scanned somehow to SAP. The information should be provided on an item level in the shipping information. There should be chosen the type of container, and in the text box the amount of bales should be informed. It would be logical to have the container number informed on an item level in the shipping information, but as there is no such variable mentioned currently in SAP, it could also be informed in the item level text box. Currently the packing list is done manually in an Excel-file. The information provided in the manual packing list includes warehouse, delivery date, customer name, material description, material number, tonnage, price, haulier registration

number, container number, seal number, bale count and sales order number. This function should be able to do via SAP. Once the net weight has been updated to SAP, the information could be pulled to a certain format that would work as a packing list. In France and CE there is no need for packing lists, as there is only delivery note to inform the customer.

In the CE there was pointed out that there are distribution channels to separate material sales and service sales. However, in the system there is also available distribution channel for intercompany sales, but it does not function at the moment. In terms of reporting this could be a good way to distinguish different cases from each other. Still, it has to be evaluated whether this is the best way to make a difference between the cases. If the implementation is difficult, there can be suggested easier and more convenient way such as the sales group separation.

The interviews for the CE personnel revealed that there are also other system related problems that add the manual work. On an order level there was recognized that the item details do not update correctly. On an order level in 3rd party sales order the first item row of the sales order does not update accordingly to the material weighing information. Thus, the first row has false volume that the system does not give permission to change. This item cannot be included in the invoice, so there has to be set an item level billing block. Also, there was recognized that the item details do not update from the purchase order to the sales order correctly. The item category has to be updated to the order manually to be ZRTS. This kind of manual work increases the processing time in SAP. The resolutions for this level system related problems have to be discussed with SAP experts that understand the system logic thoroughly.

The CRM team was looking for more control to minimize the risks. At the moment the reaction to risks was considered slow and uncertain, as they can only recommend not selling to customers that have or are about to exceed their credit limit. Although there is possibility to block the customer for sales, it is not a quick process as it requires consulting from other RCP personnel. Implementing automatic credit block would add the control over credit risk management. Credit block is implemented in the paper business sales, and the possibility was also identified in the interviews. The real sales orders i.e. from owns stock and 3rd party sales would be blocked once the order is saved to the system, and there would be a notification for the order processor as well as the person responsible for workflow-releasement. The credit block would also update to the CRM-team report. As there has not been many of these cases in

RCP sales, the follow-up could be assisted by the order handlers who see the notification. The order handler can already contact the person responsible for the sales deal, and inform CRM team as well that the situation is already enforced.

On an order level the transparency of different cases could be improved utilizing the header text box. The request for more transparency came from the CRM team. For normal sales orders the text is not needed, but all the crediting cases should be explained briefly. In order to make the processes more transparent for the credit risk management team, their reporting should also be investigated; what information is shown in their report versus what information can be saved on an order level.

6.2.   *General development points*

As stated before, the business processes in all business units (CE, Fra, UK) should be unified as much as possible. Building unified processes help in steering the processes and people. One of the biggest development points resulting from the FMEA-tool was that there is not enough control in the processes. The failure mode and effect analysis for standard sales from own stock is presented in attachment 2 to give an example. Adding more control minimizes the risks and their consequences. There should be frame agreements that clarify the dispute handling and responsibilities between the two parties doing business. The implemented workflow-function has added needed control over the order processing, but it has not been included in all of the processes. It has only been implemented to the actual sales of RCP, gate fee process and side flow sales i.e. 3rd party sales. It should be implemented to the recharges sales group and also for new sales group of credit notes.

In paper business, e.g. when sourcing chemicals, there might be things that should be considered bringing to RCP claim handling also. It is stated in the paper business rules that: "A complaint or a claim must be raised in case of deviations against specification, purchase agreement or supplier requirements (including e.g. safety and environmental aspects)." This fact could be mentioned in the frame agreement that any breaks of the contract will result as further consequences. However, the power relations between Company and its customers and vendors should be developed towards equilibrium. Thus, recharges would be justified in an official manner. However, there should also be written agreement e.g. an e-mail of the conclusion that both parties have accepted the issued recharge.

In the purchasing side there are contracts for all of the purchasing deals, but for sales there are only two existing contracts. In the interviews there were diverse opinions about the role of sales contracts; on the other hand it might tie down some possibilities as well as it minimizes the risks involved in the sales deal. However, if for example order confirmation that was signed by the customer would be taken into usage as a sales contract, the flexibility of sales function would still exist unlike in longer period sales contracts. Also the storing of these documents has to be arranged systematically. It should be thought over whether these contracts should also be stored in M-files or in another location e.g. on the common server in certain folders. Drilling down to RCP customers, customer names and finally dates or delivery numbers. One option would also be to save the contracts as attachments to the sales orders. However, there should also be some kind of control to see that the sales contracts have been done and there are documents.

The creation and storing of sales contracts should be set as certain person's responsibility. This person could be for example the order handler or invoicing person. The actual sales terms can still be negotiated by the sales manager in UK, and the monthly sales order could be marked in the Excel file, that the order handler utilizes in order creation. Purchasing personnel should use the same Excel sheet for their 3rd party sales, so that all of the information would be presented in a organized and clear manner. Usage of a Excel template would minimize the risk that some information would be missing, and it is easier for the order handler to process.

One problem that was raised by the sourcing personnel is that the purchases and sales done in the same month are not allocated for the same month. For example the sales done in May have the purchases allocated for May, but the actual sales results are allocated for June. Thus, when analyzing the purchases and sales for May, the sales are actually for April. This could be corrected by allocating the sales to the same month as the purchase orders. Other development points from the sourcing perspective is adding more automation to the process, and simplifying the process in general.

In all of the business units the possibility of making a human mistake was not considered relevant. It was said that "we try to make everything correct". However, when making things in SAP there should be a structured process how are the mistakes corrected in order to keep the

warehouse inventory accurate and avoid any other data inconsistencies. This way the process would be more structured, and solving the problem would be a lot less time consuming.

Attachment 3. presents the enhanced process flow for standard sales order from own stock. This process is described in the same level of detail as the current situation process flowchart. In this process there were benchmarked the most appropriate control-points from paper business sales, and also references to the system changes were made. The process starts with the need to sell the excess material. Next there has to be found a customer or several customers. As well as in the earlier process description also here the solvency of the existing customers has to be clarified before there can be transaction. In case the customer is new, the credit check and new customer set up-process has to be done before the sales can start. The customer also signs an agreement to follow Company code of conduct, but the agreement should also include e.g. dispute handling and general responsibilities between the two parties.

In the negotiations the sales terms are decided, and the information could be written down in an excel file that has columns for each term and customer information. Also, when closing the deal, there could be confirmed that the contact information has not changed e.g. the e-mail address where the invoices are automatically sent. Once the information about the sales order is written in an excel-file, this information can be sent to the order handling. It is easy for order handling to check the information from the excel file, and the excel file should be saved to the server in separate folder for sales per month. When saving the order in SAP, the credit check will be automatized and order will be credit blocked if the value exceeds the credit limit. Once the order has been entered, it will be blocked and requires releasement through workflow system. However, once the releasement has been done, the sales order confirmation is printed from SAP as a pdf-file and the order confirmation is sent to the customer as a sales contract. In the text field of the order could be added a text which clarifies the usage of sales order confirmation as a sales contract. The order confirmation has to be confirmed in a written format by the customer in order to serve as a sales contract. The sales contract would be valid the same time as the order: one month. Once the transportation of goods has been done and the goods issue has been delivered, the order can be invoiced. The invoices are sent automatically from SAP to the customer, and the CRM-team follows the payments.

For third party sales the biggest improvements would be that sourcing personnel would utilize Excel file for informing order handling about the sales terms, signed order confirmation would work as a sales contract and functions such as creation of packing list could be automatized. Credit block would be implemented in this sales process also, as 3rd party sales is considered as real sales.

Gate fee process is actually a sourcing process and the utilization of sales order is not logical. However, in order to arrange the money flow correctly, it has been done with the help of sales order. In this case Company gets the material and also a payment for the material intake. If the current process design is kept, there should be at least investigated whether it is possible to arrange the update from sales order to purchase order. Currently the sales order number has to be updated to the purchase order manually. The similar kind of process was not recognized in paper business or in wood sourcing, so the formulation would have to be planned based on efficiency. The other party cannot pay Company for the material intake without an invoice. Therefore, there has to be some kind of sales on Company's side. Whether the sales is done as material or as a service should be considered. The taxation between real material and service sales is different, but as this is not real material sales from one party to another, using service sales order would be more appropriate.

The reverse gate fee process was one of the processes that is not working logically compared to most usual disposal processes. This process would need re-engineering of transferring more responsibility to the other party. Nevertheless, closer co-operation with refineries should be considered. The logical disposal in other business lines is that external party picks the material up, weighs it, and charges Company the wanted amount. As mentioned in chapter 5.2.4 this is not the case for RCP residual disposal. There is a lot of manual work and transferring of papers from one place to another. In an ideal process the process steps are clear and efficient. If the transferring of responsibility to the other party is not considered possible, there can be done improvements in the current process. In this process the material and money flow move from Company to the other party. Sales order is only needed for creating tickets for the material pick-ups. It should be questioned is it possible to arrange the material pick up without the tickets. Company could do a service purchase order as in the current process to make the money flow correct. In the other party's end they make a sales order and organize the paper work from Company premises to their premises. Just instead of delivering anything, the other party comes to pick up the residuals that are weighed at the gate. The opportunity of updating weighing

information to a purchase order would have to be investigated. The service could be priced according to the weighing information. However, the contract is highly dependent on the other party's willingness to involve in this kind of arrangement. Printing of weighing confirmations and delivering them to the office for entering to the system seems non-value adding function in the process. The self-billing could be performed as in the original process.

Crediting process is rather simple, but the transparency and control could be still enhanced. Implementing the workflow-releasement system to the crediting process would improve the ability to control the process. The earlier mentioned textbox-utilization could be useful for crediting to add transparency. This way if there is interest in the specific crediting cases, it is possible to check the short description straight from the credit note request.

The changes in processes affect multiple people inside the organization as well as they might also affect the customer and vendor relationships. Changes in the SAP order handling will immediately reflect into the order handling personnel's work. The personnel have to learn new procedures, and they should be given time to process the reformation of their work tasks. There might be the risk that personnel will go back into their old habits and neglect the new procedures. In order to avoid neglecting the developed process descriptions, the change has to be organized properly. There has to be available the needed resources in order to change the processes. In order to build synergy between different business units the level of co-operation should be enhanced. There should be face-to-face meetings to share experiences and assess the RCP organization as a whole. By bringing people closer to each other the anonymity of e-mails and phone calls will be diminished.

7.   Reporting

In this chapter will be presented the current situation of the reporting and the requirements of the enhanced reporting based on the interviews and research on SAP. The current situation maps how the report is built, what variables are available and how it is utilized. The requirements map the information that different stakeholders are interested in, mainly by the management team members.

7.1.   Current situation

The current sales report data in SAP is taken with transaction MC+2. This report has been utilized since 2015, and was developed inside the company to meet the minimum requirements of sales reporting for internal use. However, the report does not present the data accurately e.g. there has been doubling of numbers, and due to the process configuration also the reporting has turned out to be misleading: the sales figures include also other cases than real sales. The report is taken for previous month by the sales manager at the beginning of next month.

The report consists of four market areas: Finland, Central-Europe, France and the United Kingdom. Each market area has columns of volume, sales and average price per product. These amounts are summed to see the totals. Also for the UK unit that consists of the Mill and the MRF, the volumes for the MRF are taken with a profit center report Y_UD2_51000133. However, the report itself does not give the straight figures, but there has to be still calculated together the average MRF processing cost and the average cost of inbound material.

The sales report is utilized by RCP management team, and some part of the report goes higher in the organization. However, the different types of sales are not separated from each other. This way all of the sales, including recharges and gate fee, is included in one total amount per area. This kind of reporting does not tell much about the current situation; what volumes are really sold as real sales and how the price development of each material is. The basic idea is that the RCP sales results show in the purchased RCP price for the mill. Thus, the sales revenues lower the price for the mill and sales losses raise the price for the mill. Also the credit risk management team has problems in defining what is real sales and what is not. This information is important in order to follow the payments of real sales. Currently the sales order type has to

be checked from each invoice manually. The manual check-up takes a lot of time, and checking the sales order type should be a lot easier.

When taking the MC+2 report you are first directed to the search menu presented in figure 11. In the current sales analysis sorting menu there are listed variables that give you the possibility to pick the wanted information from a wider data. The variables are divided into three groups: characteristics, period to analyze and parameters. The first group of characteristics consists of:

1. Sales organization
2. Distribution Channel
3. Division
4. Sales district
5. Sold-to party
6. Material

Figure 10. Sales analysis search menu

With the help of sales organization sorting, you can either take a look at one sales organization or all of the sales organizations. With the current reporting all of the areas are taken in consideration. The sales organization codes are the following:

UK: 1030
CE: 1020

FI: 1010

FR: 1050

The distribution channel is currently dividing the material sales and service sales. There is also an existing distribution channel 03 for intercompany sales, but it is not in usage. Distribution channel 10 is utilized for material sales, and distribution channel 40 for service sales i.e. non-material sales. The names of the different channels are somewhat misleading, and in the menu there are also other distribution channels that are not in use at all. The material measuring unit is set as ton (T) for both the material sales with distribution channel 10 as well as for service sales with distribution channel 40.

Division is always 00, described with the text "cross division" in SAP. The role of the division is not clearly stated. Sales district is not utilized at all, but it has remained in the menu. Next there is the customer number that enables sorting based on sold-to-party just for one customer, or by leaving it empty to include all customers. Also with material code the sorting can search sales for just one product or all products. In the period to analyze you can choose the period from starting date to ending date. For current usage, the date is the previous month's first day to that month's last day.

When choosing the drill down per material, and taking a look at one sales organization's report, there are currently in usage only few key figures as presented in figure 12: sales, billing quantity, invoiced sales cost and invoiced sales gross. There are available also other key figures such as gross orders and gross returns, but these are not that relevant as would be showing e.g. sold-to party or incoterm in sales reporting.
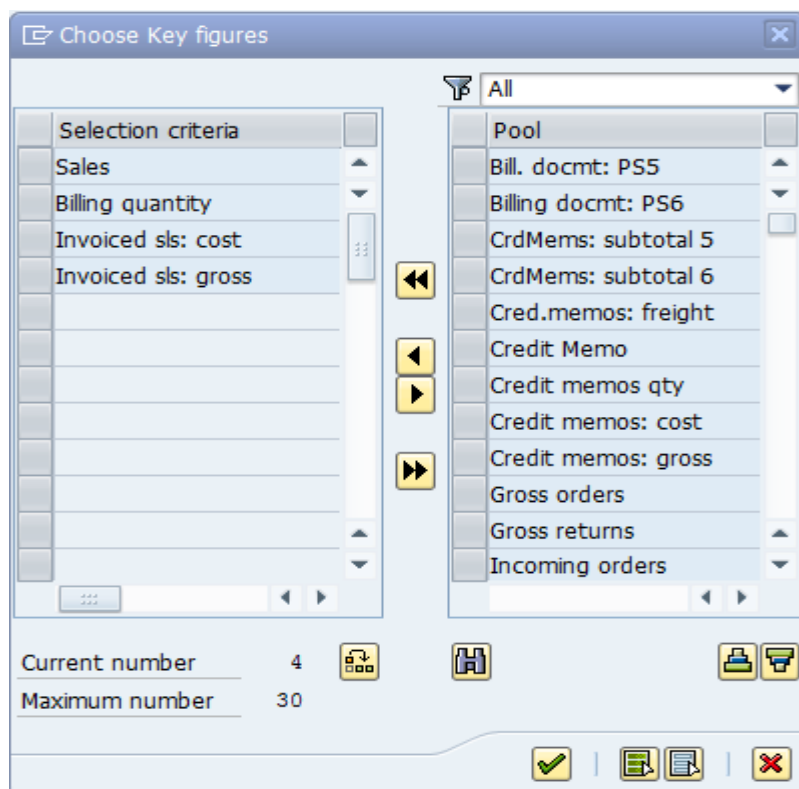
Figure 11. SAP sales report key figures

However, when exporting the data from SAP to an excel file, the data is divided to sales per customer and products sold per customer. This information has just not been presented in the current sales reporting. In the SAP it is only possible to see the drilldown by one variable, as it would be good to be able to see the drilldown first per customer and then sold materials per customer.

The data analysis is presented for the management team in a PowerPoint file. In the PowerPoint the overall sales volume of RCP and price in 12 month time for the whole market area are presented. The information is drilled down as the sales are also presented per region with the sales volume and price. Next is presented the UK sales contribution in rolling 12 month time. The sales contribution is also described in more detail as the sales contribution is divided between the MRF and other products sales. The general circumstances in the market are also commented in the end of the sales presentation. Lastly there is point out what is happening on a commodity level e.g. how the prices are developing over time.

7.2. Requirements of enhanced report

The requirements of the enhanced report was mapped with interviews of the management team members, as well as best practices and key performance indicators were also brought from other business units of the company. The need for enhancements were not clearly stated by all of the management team interviewees, but one of the main tasks for the master's thesis work was stated clearly as developing the reporting. Thus, it was confusing finding contradictory opinions about the current state of the report, and what development points people actually see there.

The development point that was mentioned by all of the management team interviewees, was that the real sales should be separated from other processes that require the usage of sales order. The real sales was considered as Company selling straight from its own stock or from 3rd party. The gate fee, reverse gate fee, intercompany, side flow sales and recharges were to be separated.

In order to be able to separate the different kind of sales, there has to be more sales groups. The current sales groups, as mentioned before, are:

110	Sales CE
120	Sales UK
130	Sales FRA
140	Sales FIN
210	Recharges CE
220	Recharges UK
230	Recharges FRA
240	Recharges FIN
310	Side Flows CE
320	Side Flows UK
330	Side Flows FRA
340	Side Flows FIN
410	Gate Fee CE
420	Gate Fee UK
430	Gate Fee FRA
440	Gate Fee FIN

Table 6. Current Sales Order Groups

In order to separate also intercompany and reverse gate fee orders, there would have to be sales group for both of them. Also for credits there could be created its own sales group in order to separate the cases from others. By separating the different cases with sales group the

transparency of processes would be enhanced – it is easy to identify different kind of cases even from SAP. The transparency was much called for by the credit risk management team, and via different sales groups it could be enhanced.

510	Reverse Gate Fee CE
520	Reverse Gate Fee UK
530	Reverse Gate Fee FRA
540	Reverse Gate Fee FIN
610	Credits CE
620	Credits UK
630	Credits FRA
640	Credits FIN
710	Intercompany CE
720	Intercompany UK
730	Intercompany FRA
740	Intercompany FIN

Table 7. Additional sales order groups

Another point that was mentioned by the personnel who are dealing with sales more or less, is that the sales margin information should be available about each customer per product per month. One of the interviewees said that "The visibility of the cost performance in relation to the price is important". However, this kind of calculation would be difficult to execute just in one report. The same kind of idea is implemented already in the excel tool presented earlier as cost model tool. And as mentioned by one of the interviewees "the RCP sales function was not formed to create profit", but to support the sourcing function in an efficient way.

The building of new report in SAP is much dependent on the processes and how they are defined. Currently as the Recharges sales group is not utilized and the recharges are entered to SAP either without a sales group or with the wrong sales group, not even the enhanced report could sort the different types of sales orders from each other. The building of work flow for recharges is the first step, in order to take the sales group into usage. Furthermore, the need for reporting other than real RCP sales is questioned. There has not come up much interest in reporting other than real sales. In the business world it is quite common that many things are reported, but what information is actually useful is a different thing.

One development point that came up with order handlers, is that more people could utilize this same report for multiple purposes. There is doubling of reporting the same things, which this one report could cover. In CE and France there are taken ZRCP revenue analysis, to report about the sales orders type, material, ordered quantity, prices, SO number, PO number, departure point, vendor and contract price. Thus, all this information could be taken with the sales report, just drilling down by market area. The credit risk management team still could not use this same report, but they could benefit from the variable that separates different cases. There could be added the sales group variable, and CRM team could sort the data to involve only real sales cases: standard order from own stock and 3rd party sales. This kind of reporting enhancement could be done rather easily.

In the sales report there should be available more variables to sort the data. The following variables came up in the interviews and were further discussed with personnel that would be utilizing the sales report:

-Market area
-Distribution Channel
-Sales Group
-Sold-to Party
-Ship-to Party
-Ordered Volume
-Delivered Volume
-Payment Term
-Incoterm

These variables can be brought easily from the order level in SAP. The market areas are the same as before. In order to separate the sales between MRF and the mill, there should be created a new distribution channel for the MRF sales. Sales groups come in as a new variable to separate different cases. Sold-to party and ship-to party help in distinguishing the differences between customers. There should also be the variables of ordered volume, payment term and incoterm.

In order to utilize the report more widely in the organization, there could also be more variables available on item-level. These variables are not necessarily needed for sales reporting, but they

would serve the wider purpose of utilizing this report. These variables were not presented by the sales personnel, but people dealing with order handling:

-Item number

-Item Category

-Plant

-Stock Location

-Shipping Point

-Route

-Route Description

All in all, the idealistic reporting would be accurate, more efficient and requires less manning. In attachment 4 is presented the ideal reporting template for RCP sales reporting. This data could be visualized in the same manner as earlier via charts and histograms, and presented in a PowerPoint file. Still, the management team members should also have easy access to the detailed information if they want to take a closer look. Thus, the excel could be added as an attachment to the presentation in order to make the reporting more transparent.

7.3. *Alternative reporting tools*

In the wood sourcing and forestry division of Company they are using a reporting tool called Tableau. Tableau is described as "business intelligence software that helps people see and understand their data" (Tableau 2016). Interest inside Company towards Tableau has increased recently especially among the finance professionals. Although the focus of this project is in developing sales reporting, it would also be worth investigating whether the purchasing data could be analyzed simultaneously with sales data as they are interrelated processes. By combining the reporting actions the overall efficiency in reporting could be enhanced. Moreover, the biggest benefit of Tableau is that it can provide business value throughout the organization for multiple business purposes.

Tableau promotes its best features strongly, but the suitability of the software has to be analyzed case by case: what are the benefits and what are the costs/downsides. In table 8. are considered the general pros and cons of the software.

Tableau Software	
Pros	Cons
-Quick Analytics	-Data preparation needed in most cases
-Easy to use	-User specific license (1800€)
-All kind of data can be utilized	-Viewers obliged to download viewing tool
-Smart Reporting	(free of charge)
-Updating of information automatized	-New way of doing requires learning
-Sharing of information handy	-Synchronization of Tableau and SAP
-Better visualization of data	requires effort

Table 8. Tableau software pros and cons

Firstly, the actual analytics can be done quickly, as Tableau connects and visualizes the data just in minutes. However, depending on the data, the data preparation phase usually requires more time than the analysis itself. Data preparation can include combining multiple data sources such as SAP and other ERP-systems. In the RCP-organization the information included in the current sales reporting could be pulled straight from SAP. The system expert mentioned that there are multiple options for connecting SAP with Tableau, and it needs further discussion which is the most suitable way. The integration process of Tableau with SAP however was said to be much easier than with most integration projects. The connection can be created in a rather fast manner, as the software should just pull the information from SAP. Once the data is in order, the software can be used for doing the actual analysis. The software is easy to use once the basic catch understood. Tableau is based a lot on drag and drop function: you can drag and drop the variables wanted in specific analysis. The company offering the software for Company provides basic training, and there are multiple training videos as well as Tableau community that can provide help in getting familiar with the features available. The current level of reporting can be reached with the basic functions of the software. However, there are multiple opportunities that the software enables e.g. correlation analysis between chosen variables.

One of the pros of Tableau is that all sorts of data can be utilized: excel files, word documents, SAP data etc. Also, the data can be updated automatically when wanted: either multiple times per day or once a month. Thus, as the wanted information is analyzed in desired way once, the

updates can be automated and all the relevant persons could access the data analysis in the Tableau server when notified about the update. Sharing of information is easy: the viewers have to download free of charge Tableau viewing tool, and it can be accessed also with mobile devices. The dashboards created with Tableau are interactive in a way that the reader can control the dashboard according to the dashboard creator's set functions. The interactivity brings the wanted transparency behind the figures, but also further information would probably have to be acquired about the reasons behind the figures. (Tableau 2016)

Currently the sales manager taking the sales reports is justified by the fact that sales is his responsibility and he knows the most about the markets. Thus, if there are surprising results or for any other reason there has to be further explanation what is happening in the RCP sales, he can provide the information most likely. In case the sales reporting would be more automated via Tableau, the need for taking the reports would disappear and only providing the background information would be needed.

As Tableau is already used in Company in other business units, also for RCP the security issues are no problem. What is comes to costs, there are the costs of purchasing the user specific license and also the integration project between SAP and Tableau. Nevertheless, the full business value this software has cannot be realized before it is taken into usage.

8. Conclusion and discussion

It is the employees' competences that govern the performance via systems, processes and work descriptions. In this chapter is presented the main results and their reflection to the theory, and also future research ideas.

8.1. Main results

The main function of RCP organization is to source recovered paper, but there are also by-products that have to be sold. Thus, the sales function should be organized in an efficient way to support the organization's main strategy for sourcing. When the sourcing function of RCP was developed in Company, the sales processes were not emphasized in the development project. The processes had their free way of formulating to fulfill the business needs with the limitations of SAP. There were formed processes that include the usage of a sales order to organize the money flow correctly. The efficiency of these processes was not questioned as they functioned. However, the usage of sales order is shown as sales in the reporting, although they are not considered real sales where Company sells material to another company and gets payment for it. Now that the paper market has diminished and the company has gone through severe saving programs, also the sales function has been taken under development. As presented in the very beginning of the thesis the research questions was: How to develop the business processes and internal sales reporting of RCP organization? In order to be able to answer the main research question the sub questions divided the topic into sections that were analyzed in the previous chapters. In the table below, are summarized the results of this research.

Development of business processes and sales reporting		
Sub-questions	**Theory**	**Results**
1. What are the current business processes?	• Process thinking • Process mapping	• Process flowcharts • Differences between business units • Usage of sales order in the processes

2. What problems have incurred in these business processes?	• Process analysis • FMEA	• SAP-related problems • Efficiency • Transparency • Control
3. How to develop the business processes in terms of information system and general business process steps?	• Process improvement • Benchmarking • Value in process	• Adding control and transparency • Value optimization • Automation • SAP-consulting from 3rd party
4. What kind of reporting is necessary in the sales of recovered paper and other side products?	• Control in an organization • Measurement of performance needed for improving	• Accurate, precise reporting needed • More variables • Less manning • Alternative reporting tool as an option

Table 9. Main results

To answer the first question, "what are the current business processes?", there were mapped the current state of processes determined by the commissioning company. This way the first step of process improvement were already taken by the commissioning company in identifying the processes under development. The processes under development were determined as: standard sales order form own stock, 3rd party sales, gate fee process, reverse gate fee process, crediting process, intercompany sales and recharges (service sales order). All of these processes include the usage of sales order for making the money flow correct; Company cannot receive payments without invoicing the other party and vice versa. As in all of these cases is used a sales order, they also show in the sales report. However, only standard sales from own stock and 3rd party sales is considered as real sales that the credit risk management team follows.

The process descriptions were built according to the interviews, learning sessions and internal data files about the processes. It was emphasized by multiple theorists that process mapping describes the analyzed process to recognize critical points, both value adding and not value adding activities. If the modelling is successful and the value creation is optimized there can be

multiple benefits in enhancing the company's competitiveness. Based on the research there were created flow charts of the current processes and also verbal explanations. The flow charts were built with the help of basic guideline. It was stated that a good process description should include critical issues concerning the process. The system related functions were thus left to the sidelines, as the focus was on the main process steps. Secondly, the process map should describe interrelations between issues. This was achieved by building flowcharts that visualizes the process flow from the starting point to the end. Thirdly, the process description should help in understanding the bigger picture and people's role in it. In the built flowcharts there were also identified the actors of the specific process steps. If there were differences between the different business units in segregation of duties, it was mentioned in the comparison of processes. Nevertheless, a good process description should also advance people's collaboration with each other, and give enough flexibility depending on the case. As there is a physical process description, it is easier for the employees to evaluate their own role in it as well as see other employees' contribution. This way the information about the processes could also be shared and stored more easily.

In order answer the second question of "What problems have incurred in these business processes?", relevant people from RCP organization were interviewed. The main results indicate that there are differences in the processes between different business units, and there are also common deficiencies. The business processes should be unified in a standardized way. Theory supports this with the justification that in most cases there are less expenses with a process that is stabilized than a process that is rebuilt over and over again. Also, standardization prevents people from going back to their old disorganized ways. There should be common tools for control in order to steer the processes, and minimize the level of deficiencies. It should not be forgotten that the enterprise resource planning system has its own limitations, and in order to develop the system, the general business process has to be built efficiently in a controlled manner. The problems occurred in the interviews were both SAP-related and general level problems. With the help of an information system the processes are strived to be harmonized and synchronized. However, the logic of a system does not always work as wanted, and alterations to ERP-systems require time and money. Many of the system related problems were in manual work that should be automated. The system related development points were identified by order handlers, process expert and contract review manager. These employees are dealing with the processes on a daily basis in SAP and thus have deeper knowledge over the issues. Many of the revealed system related development

points lie in automatizing functions and correcting system logic. On a general level there was indicated a need for enhanced transparency and control over the processes.

The third question looked into the development points in business processes in terms of information system and general process steps. The overall objective was to unify these processes as well as make them more efficient in a controlled way. With the help of FMEA-tool, the possible risk factors in processes were evaluated. There was shown need for reactive, proactive as well innovative improving. By using internal benchmarks it was possible to find improvement suggestions. For adding the control in processes, it was suggested that workflow-function would be built also for recharges sales and crediting cases. Also, there should be made frame agreements between Company and the customer in order to have ground rules for dispute handling and general responsibilities between the parties. In the sales side there are only few valid sales contracts at the moment. In order to avoid the disputes there should be sales contracts for all of the sales deals. These contracts could be formed in a simple way by utilizing signed order confirmations that are valid for one month. For more radical re-engineering there were no benchmarks for all of the processes, as gate fee and reverse gate fee were only organized in the RCP organization. Therefore the business logic for the processes was evaluated in general, and there were made recommendations in order to make the processes more efficient with the help of value chain thinking: non-value adding steps should be deleted or turned into value creating steps.

On a system level there was a clear need for increasing the automation: manual work should be minimized in order to enhance efficiency in time wise as well as minimize the data inconsistency risks. In order to minimize the credit risks, there should be taken into action an automatic credit block. The order would go to credit block if the current order value exceeds the customer's credit limit. The order handler would get a notification about the credit block, and the CRM-team would see the case in their report. If already order handlers would react to the credit risk problems, the approach would move more towards proactive process that would make the process faster. Finding resolution for SAP-related problems was relying on other business units, as system-related problems are difficult to benchmark. As Company has outsourced the system development to a third party, the functionality of SAP development ideas was not researched in this paper. In order to see if a development idea would work in SAP, there should be consulting with the third party representatives.

The fourth question looked into the current reporting and the needs for enhanced report. The interviews revealed different opinions towards the reporting: some of the interviewees were happy with the current state as part of the interviewees wanted remarkable changes. The current sales report is taken in the beginning of the next month by the sales manager. The data is pulled from SAP, processed in Excel and the key findings are shown in a PowerPoint presentation. The report is utilized by the management team, and part of that report goes higher in the organization. The research indicates that the biggest problem in the reporting was that different kind of cases that include the usage of sales order cannot be separated from each other. Currently all of the cases show as real sales where Company sells material for a customer and receives payment for the delivered material. The resolution for separating the different cases would be to firstly establish new sales groups for reverse gate fee, credit notes and intercompany sales. There should also be created a workflow for the recharges sales group in order to take it into usage. This way there could be identified real sales with the sales groups of standard sales from own stock and 3rd party sales. Also, if in the future there is any need to analyze the other sales groups in terms of performance, e.g. credit notes, it can be done conveniently. In order to improve anything it has to be measured. In the current report the UK unit was divided to the mill and MRF with the help of profit center report. In order to separate the MRF sales from the mill sales in the new report, there should be an additional distribution channel for the MRF. According to the system expert this kind of separation would be easier to implement, than determining the sales according to the profit center as it comes from the material master data. In order to further enhance the transparency of the reporting, there should be added more variables. With added variables the report could also be utilized for other reporting purposes than just sales reporting.

Also the option of an alternative reporting tool was researched. In other business lines of Company there is already utilized a data analysis software called Tableau. The biggest benefit of Tableau is that it can provide business value throughout the organization for multiple business purposes. The software is based on simple drag and drop function where the user drags the wanted variables to the wanted form visualization. The data for analysis can be from multiple sources and it is usually the data preparation that takes time. In case of RCP the data could be dragged rather easily from SAP, as it is based on the current sales reporting. However, with the help of Tableau there could be advanced analysis e.g. correlation analysis, and the sales data could be combined with the purchasing data at least in some cases. This way the whole value chain from the vendor to the customer could be analyzed. Tableau also enables

interactive reporting that allows the reader to see behind the figures. The current reporting lacks in precise presentation, but it would be enhanced with the stated development ideas. Still, as the data is dragged form SAP to an Excel-file, the Excel-file requires manning before the actual PowerPoint presentation is ready. With Tableau once the initial reporting decision is made, the reporting can be automatically updated to a server. The updated report could be available only to management team members, and the sales manager would only have to give insight to the numbers i.e. what are the reasons.

As it was stated in the theory part, corporate governance should ensure the shareholders' benefits by improving company's performance and ensuring conformance to regulations. Performance of the processes was enhanced by value chain optimization and risk minimization, and conformance was ensured by adding controls that also improve transparency. Reporting is a normal way to follow performance. However, the reporting itself does not bring value but how this information is utilized in decision making. In this paper however the value of valid information for decision making was not researched.

Company is contributing to the circular economy ideology by turning waste into a resource. For example in Finland the paper is purchased from a company that collects the paper from households, it is processed in the mill and turned into new paper products. In the UK on the other hand as a result of sourcing there come also other by-products that Company cannot utilize. These products are sold, but the efficiency of the sales function is not always guaranteed: fluctuations in the market price makes it hard to predict what the sales result is. Higher level of stability could be achieved by increasing cooperation with companies that need the by-products of RCP organization, or even from other Company's business lines. Companies should cooperate in order to build circular pattern in their supply chain. The possibilities in developing some level of industrial symbiosis should be investigated as it might provide a competitive edge. The objective of industrial symbiosis is to achieve economic and environmental benefits by taking full advantage of by-product utilization and simultaneously diminishing residuals or treating them efficiently.

All in all, people are in important role for making company successful. Having the right people, with the right competencies, in the right positions helps in gaining the competitive edge. Change from one way of doing to another requires appropriate leadership. The possible changes have to be implemented properly so that everyone is aware when, why, how and by

whom the changes are carried through. Processes and policies are enacted by the employees that either follow the wanted standardized processes or not. Therefore, control is needed to ensure the process functionality. Without control the processes would not be functioning in a desired way. With control the risks are minimized and the possible threats can be reacted to.

8.2. Further research

This research looked into two areas: development of processes and reporting. The research was done as a single-case study in the recovered paper sourcing organization. Thus, similar kind of study could be done e.g. in different industry or another product line. As business environment changes it has effect also on companies processes; there should be created high value in an efficient way. Thus, the reconstruction of processes is evident.

Further research could also concern the implementation of improvements: how to implement the changes into the processes. This could be considered on employee level, as the system improvements are done by third party companies who just follow the customer's wishes in building the system. There is already a lot of research done in the area of change management, but this case would be differentiated from them with such variables as industry, strategy and roles.

When thinking about the role of reporting, the future research could concern the role of business analytics in value-creation across the organization. These days there is done a lot of reporting, but the actual value that lies in that data is not appreciated as much. The research topic could be for example how can business analytics create value in purchasing, sales or some other business function. The research could look into different analyses, analyzing tools and utilization in decision making.

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Attachment 1.

Interview framework for theme interviews, RCP personnel

Questions altered accordingly to the person's role in the organization.

1. Current business processes

-Special characteristics of the market area (FIN, UK, FRA, CE) in RCP sourcing? and sales?

-Which sales processes are in use in which business case?

- Which roles are involved in the sales process?

-How does the process go from your perspective?

-SAP related process characteristics?

2. Possible problems/development points in the processes

-Problems/development points with SAP?

-Possible problems/development points in the process steps?

- Information flow
- Document handling
- Co-operation with credit risk management-team
- Invoicing
- Control / Risk management
- Manual vs. automated functions
- Any other issues that come up during the discussion.

 -Own ideas about how the processes could be developed?

3. Reporting

-How is the sales reported currently in RCP organization?

-What are the key figures in sales reporting in general?

-What do you think about the current reporting of RCP?

-What are they key figures for RCP sales reporting?

-How could the reporting of RCP sales be developed?

Attachment 2. Failure modes and effect analysis

FAILURE MODES AND EFFECT ANALYSIS

Process: Standard sales from own stock

Process step	Potential failure mode	Potential failure effects	Potential causes	Current process controls	Actions recommended
What is the step?	In what ways can the step go wrong?	What is the impact on the process customer if the failure mode is not prevented or corrected?	What causes the step to go wrong? (i.e., How could the failure mode occur?)	What are the existing controls that either prevent the failure mode from occurring or detect it should it occur?	What are the actions for reducing the occurrence of the cause or for improving its detection?
Need to sell excess material	The market price for the excess material is down	The sales price for the excess material affects to the mill raw material price	Unstable markets	Some sales contracts	Creating closer relationship with refineries to stabilize prices
Find a customer	Customer not found with reasonable sales terms	The excess material ha to be sold with low price	Unstable markets, inaccuarte predictions	Sales negotiations	Having closer relationship with refineries
Opening a new customer account/ continuing with an old customer	The customer is lacking relevant documents, solvency not adequate	The customer is not suitable trading partner i.e. the sales deal is illegal, the customer is not capable of paying the invoice	Inadequate document handling, not following the process of opening a new customer account	Check up on relevant documents, M-Files for storing the documents	Following the process of opening a new customer account, close co-operation with CRM-team
Sales negotiation					
Sales terms listed in an excel-file	The customer does not agree with the listed terms	Data inconsistency	Customer refuses to pay the invoice with the false amount	Customer contacts order handling/sales manager for the incorrect information	Sales order in SAP should be used as a sales contract that the customer has to sign for the sales to happen
Create sales order in SAP	Data inconsistency	Human error	Customer receives wrong material	The information listed in the excel-file is transferred to SAP, work flow notification for the person responsible for the sales	
Work flow notification	Work flow notification is not noticed/ released by the person responsible	The person responsible is not available	The order stays blocked	The person responsible has to be available	There sould be a second person named for back up

Create outbound delivery					
Send relevant information and documents to the customer	Relevant documentation is not provided to the customer	Customer can not come to pick up the material	Human error	Customer contacts in case of any problems	Documentation to be available in an online service
Create goods issue					
Create invoice	Invoice is not created	Human error	The customer can not pay the invoice without invoice	Invoices are created	Automatizing the invoicing
Send invoice	Invoice is not sent	Human error	The customer can not pay the invoice without invoice		Automatizing the sending of invoices
Receiving of payment	Customer does not pay the invoice	Customer will be blocked for sales	Customer does not receive the invoice, the customer information is wrong etc.	Customer should contact the supplier in case of problems, CRM-team follows the payments	There should be regular check-up on customer information

Attachment 3. Improved sales process

IMPROVED PROCESS DESCRIPTION FOR STANDARD SALES ORDER			
Process step	**Description**	**Risk**	**Control / Resolution**
1. Need to sell excess material	Excess material in warehouse	Lack of negotiation power over sales terms	Closer relationships with customers and vendors
2. Find a customer	Existing customer/ New customer		
2.1. Old customer	New sales order for a customer that has the customer account set up	Data inconsistency in the customer account, credit limit exceeded, invalid care of duty documents	CRM reporting, Credit block
2.2. New customer	Setting up the new customer in SAP, checking credit information, needed documents for business saved in M-Files	Inadequate credit background and still there will be sales Missing care of duty-documents	Credit block M-files notification about the validity of documents
3. Negotiations	Negotiate over: -Product -Price -Volume -Incoterm -Schedule -Payment term	Miscommunication, not agreeing to the set terms of sales	Creation of frame agreement to define dispute handling Creation of sales contract
4. Sign the frame agreement	The frame agreement defines the responsibilities of both parties and dispute handling	Frame agreement not signed	Unclear responsibilities between the two parties

5. Create sales order in SAP	Creating sales order with the terms of sale	Data inconsistency	Customer's inspection over the order confirmation
6. Automatized credit check	The order value is automatically verified against credit limit	Customer exceeds the credit limit	Automatic credit block. Credit blocked deleted once payment for earlier invoice received (CRM policies)
7. Creation of sales contract	Creation of a simple sales contract with the terms of sale	Risk of not using the written contract form	The sales contract has to be attached to the sales order in SAP (?)
		Data inconsistency in the sales contract	Order handler goes through the check list, customer's inspection over the order confirmation
8. Workflow releasement	Person responsible will get notification, and checks the sales terms from the sales order: release or keep blocked for further investigation	Sales order not released	Order handling follow-up
9. Order confirmation	Print order confirmation from SAP as PDF-file, and send it to the customer // Possibility of automation in SAP	Order confirmation not created	Signed order confirmation functioning as sales contract

10. Create outbound delivery	create outbound delivery in SAP.	Outbound delivery not created and the order processing does not proceed	Follow up of open sales orders
11. Document handling	Send via e-mail the documents, depending on incoterm and if export -Care of duty (UK) -Annex 7 (if export) -Delivery note -CMR	All the needed documents are not sent	More organized handling of documents, storing the documents to a common server
12. Customer picking up the material // (Delivery of the material))	Start weight at the gatehouse with an empty truck	Malfunction with the weighing system	Customer's weighing results
13. Loading	Loading of the materials, taking photographs of the loading	Malfunction with the camera, customer requires crediting	Clause included in the frame agreement about dispute handling
14. Packing list creation	Packing list printed from SAP	Packing list is not formed in SAP	Data inconsistency
15. End weighing	Net weight of the load. Weight updated to SAP during the night.	Malfunction with the weighing system	Customer's weighing results

16. Goods issue			
17. Create invoice	Invoicing in SAP	Invoice not created	Taking a report from SAP about the invoiced and not invoiced orders
18. Automated sending of invoices	Automated function	System malfunction, data inconsistency in SAP for contact information, e-mails.	Reminders sent about the invoice, before the due date and after the due date.
19. Receiving the payment	Customer pays the invoice	Customer disagrees with the invoiced amount, customer does not pay	CRM team follows the payments

Attachment 4. Proposal for new RCP sales report

Reporting proposal, RCP sales, variables

1. Market areas

Market areas stay the same as in the initial sales report in MC+2.

Market Area	UK	CE	FR	FI
Code	1030	1020	1010	1050

2. Sales groups

There are created new sales groups in order to cover all of the business cases.

Sales group	Sales group codes/area	SAP sales order type
RCP Sales	110-140	ZRCP
Recharges	210-240	ZRDR
Side Flows	310-340	ZRCP
Gate Fee	410-440	ZRGF
Reverse Gate Fee	510-540	ZRGF
Credit notes	610-640	ZRCR
Intercompany Sales	710-740	ZRIN

3. Distribution channels

There is created new distribution channel for MRF sales to separate the MRF sales results from the mill sales.

Distribution Channel	Description
Material	10
Service	40
MRF Sales	20

4. Customer information

In the previous sales report there was available the sold-to party name, but also the ship-to party as well as the coding is required.

Sold-to party name	Sold-to party code
Ship-to party name	Ship-to party code

5. Material information

The material information is presented the same way as is in the MC+2 report.

Material description	Material code

6. Volume

The volume should be in tons (T) for delivered material, and activity units (AU) for services.

	Material	Service
Delivered volume	(T)	(AU)

7. Price & Currency

The price is presented as a default in €, but it can be changed already in the current MC+2 search menu to £ if needed.

8. Other sales terms

There was indicated interest also in payment term and incoterm on the single sales orders.

Payment term	Code	Description
Incoterm	Code	Description

9. Item level information

The item level information enables detailed reporting. Also wider usage of the same reporting template is possible.

Item number
Item category
Plant
Stock location
Shipping point
Route
Route description